Application Site Report
In support of the
Part A2 Environmental Permit
Application for Falcon Steel Ltd

Prepared for:

Falcon Steel Ltd
Waunarlwydd Works, Swansea

Prepared by:
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Contents

Executive Summary

This Application Site Report has been prepared by ENVIRON and Falcon Steel, Swansea in accordance with the Environment Agency's (EA's) IPPC guidance.

The facility occupies part of the former Alcoa facility located at Waunarlwydd Works, PO Box 68, Swansea SA1 1XH at approximate National Grid Reference 260440, 196070 (Figure A of Appendix A). The total site area is approximately 5.5 hectares and comprises the coil preparation line, coil coating line and cut-to-length line, with associated storage and yard areas.

The facility is located within the existing Alcoa facility surrounded by industrial facilities occupied by Timet to the north, Alcoa to the south and West, and the site access to the east. Beyond the Alcoa buildings to the south lies the residential area of Bridge Road, approximately 250m south.

The Environment Agency website "What's in Your Backyard" indicates that the site is in an area that has a significant chance of flooding. The chance of flooding each year is greater than 1.3% (1 in 75). Site personnel are unaware of any flooding events at the site.

Falcon Steel plan to operate a new facility at the site of the former Alcoa – Mill Products site in Waunarlwydd, Swansea (hereafter referred to as Alcoa). Falcon Steel have utilised the former aluminium coil pre-treatment and lacquer coating lines and modified them such that they are suitable for use as a galvanised steel PVC coating and painting process line.

Planned production capacity is 72,000 tonnes per annum. The company will employ approximately 60 people, and will occupy a land area of approximately 5.5 hectares, with a total covered building area of approximately 20,000 sqm within the former 35 hectare Alcoa site.

Due to the proposed site operations, the installation is defined as a Part A(2) Process under Schedule 1, Section 6.4 "surface treating substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating, in plant with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year, s6.4A(2)(a))" of The Environmental Permitting (England and Wales) Regulations 2007.

The installation includes not only the coil coating line surface treatment activities but also directly associated activities which have a technical connection with the surface treatment activities and which may have an effect on emissions and pollution.

The site has two bulk tank farms and a dedicated barrel storage area. All storage areas will meet BAT requirements as detailed in Sector Guidance Note IPPC SG6. During the site walkover close attention was paid to the construction of the bund walls and hardurfaced areas. Hardstanding was observed to be constructed almost entirely of concrete with occasional use of asphalt. The hardstanding was observed to in moderate to good condition with no significant cracking and or traces of surface staining around process areas

Risks of spillages are minimised by locating all chemicals storage areas and hazardous wastes storage areas inside bunded areas. Deliveries of chemicals and collections of wastes are carried out by driving the collection or delivery vehicle to the relevant area and utilizing fork lift trucks.

Leakages within the process areas are unlikely. However, all process pipework and storage tanks are above ground within hardsurfaced areas which are not connected to drainage systems.

Management systems utilized by Alcoa when the site was formerly in operation have been retained and will be utilized by Falcon Steel to ensure chemical storage and handling procedures do not result in the release of hazardous substances to ground, surface water or groundwater.

Based on the information presented in the following report, for all relevant activities at the installation there is little or no likelihood that land pollution or leaks to the land will occur during the future life of the installation.

It is the conclusion of this report that reference data for the site does not need to be collected.

1 Introduction

This Application Site Report has been prepared by ENVIRON and Falcon Steel, Swansea in accordance with the Environment Agency's (EA's) IPPC guidance.

1.1 Site Location

The facility occupies part of the former Alcoa facility located at Waunarlwydd Works, PO Box 68, Swansea SA1 1XH at approximate National Grid Reference 260440, 196070 (Figure A of Appendix A). The total site area is approximately 5.5 hectares and comprises the coil preparation line, coil coating line and cut-to-length line, with associated storage and yard areas. Waunarlwydd Works is located in a shallow valley in a mixed area of agricultural land, other industry and residential properties. The installation is located on a generally level plot approximately 17m to 18m above ordnance datum (AOD).

The facility is located within the existing Alcoa facility surrounded by industrial facilities occupied by Timet to the north, Alcoa to the south and West, and the site access to the east. Beyond the Alcoa buildings to the south lies the residential area of Bridge Road, approximately 250m south. This is the closest residential area to the site. The closest school is Y Login Fach Bilingual Primary School, approximately 550m south east. There are no hospitals within a 1km radius of the site.

The Environment Agency website "What's in Your Backyard" indicates that the site is in an area that has a significant chance of flooding. The chance of flooding each year is greater than 1.3% (1 in 75). This takes into account the effect of any flood defences that may be in this area, whether or not these are currently illustrated on the Flood Map

1.2 Details of Installation

Falcon Steel plan to operate a new facility at the site of the former Alcoa – Mill Products site in Waunarlwydd, Swansea (hereafter referred to as Alcoa). Falcon Steel have utilised the former aluminium coil pre-treatment and lacquer coating lines and modified them such that they are suitable for use as a galvanised steel PVC coating and painting process line.

Planned production capacity is 72,000 tonnes per annum. The company will employ approximately 60 people, and will occupy a land area of approximately 5.5 hectares, with a total covered building area of approximately 20,000 sqm within the former 35 hectare Alcoa site. The boundary of the installation is marked in Figure A2 in Appendix A.

The main process areas of the plant are associated with coil preparation line, coil coating line, cut to length line and packing. Falcon Steel also plan to construct a galvanising plant and utilise the existing (former Alcoa) cold mill which is installed within the adjacent building.

The Coil Preparation Line has several functions. The coils are levelled, i.e. to remove creases and dents prior to cleaning with a caustic cleaning solution and associated rinses. All material is the surface treated using a 'dry in place' chromate conversion coating which treats the surface to allow for the necessary adhesion properties of the coatings.

Rinsing is carried out by mains water. A schematic of the coil preparation line can be seen in Appendix B1.

Steel coils are then transferred to the Coil Coating Line. This line applies the primers and surface coatings lacquers to the sheet. A range of plastisol colours can be applied to either surface of the sheet or to both surfaces of the sheet as required prior to drying within in a continuous horizontal oven.

All primed coated coils are transferred to the Cut to length lines and Packing section where they can be cut, as necessary to customer specification length. The coils are loaded onto pallets and as necessary, a protective plastic shrink-wrap is provided.

Due to the proposed site operations, the installation is defined as a Part A(2) Process under Schedule 1, Section 6.4 ”surface treating substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating, in plant with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year, s6.4A(2)(a))” of The Environmental Permitting (England and Wales) Regulations 2007.

The installation includes not only the coil coating line surface treatment activities but also directly associated activities which have a technical connection with the surface treatment activities and which may have an effect on emissions and pollution. As described above these include:

- storage and handling of input chemicals and steel coils;
- mechanical preparation of the work to be treated in the coil preparation line;
- caustic cleaning and chromate conversion in the coil preparation line;
- coating of the metals on the coil coating line;
- rinsing of the prepared coils;
- drying of the treated work;
- coating of the coils on the coil coating line;
- fume extraction and fume abatement system;
- effluent treatment;
- handling of spent process fluids; and
- handling of wastes.

These activities are described in detail in Section B2.1 of the main Part A(2) application document.

Falcon Steel Ltd have applied for a discharge consent for the discharge of trade effluent to foul sewer, which is under consideration by Dwr Cymru Welsh Water. It is expected that the conditions attached to the consent will be the same as for the now surrendered Alcoa discharge consent which applied to the same processes.

2 Objectives

The objectives of this report are:

To satisfy the requirements of the PPC Regulations at time of permitting by:

- Identifying the environmental setting and land pollution history of the site;
- Identifying activities that will be conducted at the installation that may lead to land pollution;
- Identifying and assess the preventative measures that are in place to protect the land; and
- Assessing whether there is:

  1. little likelihood that land pollution or leaks to land will occur during the future life of the installation;

  or there is:

  2. a reasonable possibility that there is potential for current or future land pollution of the land from the installation.

3 Site Setting and Sources of Desk Study Research Information

3.1 Introduction

The following sections detail the sources of desk study information searched in order to describe the condition of the installation and, in particular, to determine the potential for substances to be present in, on or under the land associated with present and past uses of the site and its surrounding areas.

3.2 Environmental Consents, Licences, Authorisations, Permits and Designations for the site and Surrounding Area

The Environment Agency and Landmark Information Group were requested to provide records of any Discharge Consents, Waste Management Licences, Abstraction Licences, IPC Authorisations, PPC Permits and Land Drainage Consents for the site and within 1km of the site boundary.

Dwr Cymru (Welsh Water) was requested to provide details of any Trade Effluent Consents for the site.

Countryside Council for Wales and Swansea City Council were requested to provide details of any Nature Conservation Designations for the site and within 10 kilometres of the site boundary. The locations of Designated Sites within the vicinity of the site are shown on Figure A5.

Their responses are contained in Appendix C1.

3.3 Geological and Hydrogeological Data

Geological and hydrogeological information for the site was obtained from the following sources and is reproduced in Appendix C2, and a geological map is included as Figure 1 of Appendix A2.

- British Geological Survey (BGS) 1:50 000 Series Sheet 247, (Solid and Drift).
- British Geological Survey (BGS) 1:10,560 Series Sheet SS 69 NW (Solid and Drift).
- British Geological Survey (BGS) 1:10,560 Series Sheet SS 59 NE (Solid and Drift).
- National Rivers Authority (NRA) "Policy and Practice for the Protection of Groundwater", Groundwater Vulnerability 1:100, 000 Map Series, Sheet 35, West Glamorgan.
- Information provided by an environmental database report (Envirocheck).
- Information provided by previous ground investigations undertaken at the site by: Applied Geology: Hydrological Study Phase 1, February 1992; Geraghty & Miller (G&M): Site Wide Hydrogeological Survey, Waunarlwydd Works, Swansea, February 1994; ExCAL

Limited: Site Investigation, September 2002; Natural Solutions: Addendum to the ENVIRON Site Condition Report (2003).

- BGS Borehole Archive Data for a 1 km radius around the centre of the site.

Data obtained from investigations undertaken at the site are reproduced in Appendix C5.

An excerpt of the relevant geological map is included as Figure A3 in Appendix A. BGS Archive date is reproduced in Appendix C2.

Hydrological data was obtained from the Environment Agency for the water courses within 250 of the installation. This is reproduced in Appendix C3.

3.4 Site Operational Records, Emergency Response Records and Records of any Land Pollution Incidents in the Vicinity of the Site

The site is not yet operational. Any contamination present at the time of commencement of operations is deemed unrelated to the permitted activities at the site.

The Environment Agency was approached to provide records of any land pollution incidents associated with the site and within 1km of the site boundary, the response to which is also included within Appendix C4.

Site operational layout plans, including the location and nature of underground services and pipelines are shown in Appendix A3, A4 and A6.

The location of bulk storage tanks and raw materials / product storage areas are shown in Appendix A6.

Site foul and surface water drainage plans are included as Appendix A4.

The site has a dedicated fire and emergency response team, and the security gatehouse is manned 24 hours per day, ensuring prompt action should an incident occur.

3.5 Existing Site Investigation and Assessment Reports

A list of investigations and assessments undertaken on the site has been included in Appendix C5 and summarised. Copies of the reports are available on request.

4 Site Reconnaissance

4.1 Introduction

The site reconnaissance was undertaken on 15th May 2008 by ENVIRON on the area shown on Figure 1 of Appendix B1.

The purpose of the reconnaissance was to inspect the site and surrounding area for indicators of potential land pollution. Site infrastructure was visually inspected to assess its competence and potential to cause or have caused releases to land.

The following site features were inspected and as a result any indicators of potential areas of land pollution are shown in Appendix B1. Photographs of features are included in Appendix B2.

4.2 Storage Tanks and Associated Pipe Work

Bulk storage tanks present at the site are listed in Table 4.1. This table describes the contents, volume and condition of the tanks, along with a description of the draw-off pipework and details of integrity testing.

All storage at the site is above ground. There is no underground storage of any material at the site.

The locations of the tanks and pipe work are shown in Appendix A6.

4.2.1 Bulk Storage

All coatings are stored within the bulk coatings storage facility. The details of this facility are outlined within section B2.4 (raw materials storage) of the main application. The bulk storage facility is located to the south of Building 820B (the coil coating line).

Barrel storage is located at the eastern area of the site, within the drum storage compound and the area known as the pallet store. Storage areas are shown on Appendix A6.

Table 4.1: Bulk Tank Storage

Tank No.	Contents	Volume (litres)	Fill Point	Secondary Containment	Integrity Testing	Pipework	Observations
1	PVC Plastisol	25,000	Fill points are located within two lockable cabinets which drain to the bunded area.	The tanks are located within a concrete bund of over 110% of individual, and over 25% of aggregate tank capacity, in good condition. The bund is to be epoxy sealed to ensure it is impervious to the stored contents.	Integrity testing will take place on a regular basis as per the site management plan which meets BAT as described in Sector Guidance Note IPPC SG6.	All pipework is steel and is present in a concrete lined trench protected by steel inspection covers.	None
2	Epoxy (polyester) Primer	25,000					
3	Backing Coat	25,000					
4	Plastisol Primer	25,000					
5	PVC Plastisol (Grey)	25,000					
6	Other Plastisol Colours	25,000					
7	Other Plastisol Colours	25,000					
8	Other Plastisol Colours	25,000					
9	Waste Plastisol	25,000	Fill points are located within a lockable cabinet which drains to the bunded area.	The tanks are located within a concrete bund of over 110% of individual, and over 25% of aggregate tank capacity, in good condition. The bund is to be epoxy sealed to ensure it is impervious to the stored contents.			None
10	Methyl Ethyl Ketone (MEK)	8,000					Desiccator attached to tank vent

Each of the tanks will be equipped with the following features and are considered to meet the indicative BAT requirements stated within Sector Guidance Note IPPC SG6.

- All secondary containment shall be impervious and resistant to the solvents in storage;
- All secondary containment shall completely surround the tanks;
- The secondary containment provided around each tank is greater than 110% of the maximum storage capacity of each individual tank and greater than 40% of the aggregate storage volume of all tanks;
- All fill points are located within the confines of the secondary containment walls;
- All tanks are equipped with level gauges/indicators and high level alarms to prevent overfilling;
- All tanks will be back vented to the delivery tanker during filling
- Breathing losses from the tanks will be minimised by through the installation of vacuum relief valves
- The exterior of the bulk storage tanks shall be suitably coloured and identified to meet with international requirements.

Other design and management considerations that shall be applied to the bulk storage facility will be;

- All delivery connection shall be located within the confines of the secondary containment;
- All connections shall be fixed and locked when not in use.

4.2.2 Drum store

The paint coatings for the steel coils are to be stored in their original 205-litre drums within an area currently known as the Pallet Store and drum storage compound. Drums will be moved by fork lift truck to the coil coating line building on an as needed basis. The coating manufacturer is to supply the coatings on bunded pallets which will be kept with the coatings at all times to limit the potential for accidental spillage.

This building is located on hardsurfacing in good condition at the east of the site. The hardsurfacing in this area and on the fork lift transport route to the coil coating line is visually inspected regularly to detect any signs of deterioration, cracking or spillage.

MEK solvents used for cleaning will be stored within barrels and located internally upon proprietary bunded trays and containment stands.

4.2.3 Drum heater

Up to thirty two 205-litre drums can be placed into the drum heater, which uses air blowers to heat the contents to 30°C. The drum heater is internally bunded, with the drums stored on

steel wire flooring to ensure leaks or spills are retained within the drum heater unit. Drums are placed in the drum heater with a fork lift truck and are moved to the coil coating line after heating. The drum heater unit is to be relocated adjacent to the coil coating line building, near to the bulk storage tanks. This will help to ensure that the potential for spillages in transit are minimised.

4.2.4 Waste storage

With the exception of waste lacquers, which are to be stored in a bulk storage tank within the tank farm, wastes are to be stored locally to generation, inside the process buildings. This will help to ensure that wastes are not stored open to the elements or where leaks or spills from waste receptacles would enter the drainage system. More information related to waste storage and disposal is located in the Main Application Document Section B2.5.

4.2.5 Process tanks and pipework

There is a holding chamber within the coil preparation line which holds the chromate rinse. This chamber includes a pump which sends the chromate rinse to a “squeegee” system which wipes the coils with rinse solution. The excess solution is returned to the chamber before recirculation. This chamber is located above ground and has no history of leaks or spills. In addition, the coil preparation line is located within an area of sealed hardstanding in good condition which does not contain connections to the site drainage system.

4.2.6 Effluent treatment batch tanks

The effluent treatment batch tanks are located in the northern area of the site, adjacent to the coil preparation line building. There are three open-topped concrete batch tanks of unknown volume. The tanks are approximately 2.5m deep.

The batch tanks accept rinse water from the coil preparation line, which is a slightly caustic effluent. Treatment of this rinse water is limited to automatic sampling and pH correction, prior to discharge to mains sewer operated by Dwr Cymru Welsh Water.

At the time of the walkover survey the batch tanks were noted to be located on concrete hardstanding (see Figure A4 in Appendix A), which was observed to be in generally good order with no significant cracking or traces of spillages or surface staining. It should be noted that the batch tanks were preciously part of a larger effluent treatment plan which has since been decommissioned and removed after the facility was vacated by Alcoa. This hardstanding is visually inspected regularly to detect any signs of deterioration, cracking or spillage.

4.3 Concrete Hardstanding and Bunds

The hardstanding within the process areas was noted to be in good condition with no evidence of significant leaks or spills. There are no drains present within the buildings, so there is no pathway for any leaks or spills to reach the drainage systems. At the time of this report the internal areas were in the process of being renewed, with all internal concrete floors to be painted to make them impervious.

Foundation drawings held by Alcoa indicate that the Coil Preparation Line is underlain by concrete up to 2085mm (2.085m) thick. A series of shallow sumps are present along the Coil Preparation Line which lie within the concrete foundations. The drawings indicate that the sumps are lined with acid resistant brick and that the bases of the sumps do not exceed the thickness of the concrete.

External hardsurfacing was noted to be in good condition with no signs of leaks, spills or cracks. External hardsurfacing that is not within a bund drains to the nearest surface water drains.

All areas of hardsurfacing (both internal and external) are subject to regular visual inspections to ensure that evidence of damage or wear and tear is corrected at the earliest opportunity.

4.4 Vegetation

There is one area of vegetation present on site, at the north western corner. This is a grassed area adjacent to the interceptor present on the Alcoa site to the west. No processes or materials storage takes place in this area.

At the time of this report there were two areas of unsurfaced ground:

- The area surrounding the bulk storage tanks – this area is scheduled for hardsurfacing in June 2008, to ensure this area is impervious to the substances stored in the bulk tank farm.

- To the west of the site, adjacent to the grassed area – this area is not used for process or materials storage and so will remain unsurfaced.

No evidence of any “stressed” or discoloured vegetation was evident at any point on the site.

4.5 Surface Water Features

An unnamed stream which is a tributary of the Gors Fawr Brook is present beneath the northern area of the site. The stream is culverted and is shown on Appendix A4. The stream could not be inspected within the culvert. There are no other surface water features present on site.

4.6 Nature of the Storage and Handling of Materials

All potentially polluting storage and/or handling activities are carried out within areas of hardsurfacing surrounded by bunding. Any spillages within the bunded areas are contained.

- Substances handled outside of bunded areas are limited to drum movements. Drums are to be transported on proprietary pallets which are integrally bunded when moved between storage and processing areas;

- All tank bunding present in vehicle manoeuvring areas is equipped with crash barriers to prevent bund and tank damage in the event of a collision;

4.7 Surface Water and Foul Drainage

There are no interceptors present within the land holding of Falcon Steel. However, surface water from the south of the site is routed through a three-stage interceptor present on the Alcoa land to the west of the subject site. No activities undertaken at the Falcon Steel site would cause the release of any material to these surface water drainage system connected to this interceptor.

The surface water drainage system carries surface runoff from roofs and areas of hardstanding. The surface water drains discharge into the Afon Llan through a drainage channel to the north west of the site. No drainage at the site is discharged to soakaways.

In case of a fire, the fire-fighting water could be discharged through surface water drains. It is intended that Falcon Steel will obtain proprietary drain covers to seal off the drainage system in the event of a fire to prevent fire-fighting water, containing combustion products and potentially chemicals or waste materials, from reaching surface waters.

The foul sewer drains are marked on Figure A4 and in addition to the process water which is directed to the three batch tanks, includes sanitary effluent from toilets and wash rooms. In the event of a leak or spill to the foul drainage system, the outflow from the batch tanks can be shut off. Therefore the potential for fugitive releases of chemicals or oils into the sewer from the installation is therefore considered low.

5 Assessment of Land Pollution Potential

5.1 Polluting Substances and Relevant Activities

A list of all substances used, stored, manufactured (or waste by-products from the manufacturing process) is contained in Appendix D1. An assessment of their pollution potential has been made based upon their properties, toxicity and volume stored, used or manufactured. Those substances thus identified in Appendix D1 have been taken forward to 5.2 below.

5.1.1 Coil Preparation

An alkaline cleaner, Ridolene 287Y, will be used to clean the steel coils. Ridolene is non-combustible but care must be taken to prevent contact with the skin and release to drains, surface water and groundwater without treatment. Spilled Ridolene is alkaline and can be neutralized and absorbed by the commercial spill kits present on site.

Coiltech ZR360C is a chromate conversion coating to prepare the coil surface to accept coatings. This substance will be taken from a single proprietary 1,000 litre IBC located adjacent to the coil preparation line and pumped direct to the point of use, limiting the potential for release. Coiltech ZR360C is non-combustible but care must be taken to prevent contact with the skin and release to drains, surface water and groundwater without treatment. Spilled Coiltech ZR360C can be neutralized and absorbed by the commercial spill kits present on site.

5.1.2 Coil Coating

The site uses a range of lacquers, backing coats and polyester surface treatments which are flammable. The substances are pumped directly to the point of use from the bulk storage tanks to the mixing and application point on the coil coating line. MSDS information for the substances used is stored at the point of storage and use and is available on request.

5.1.3 Historical Contamination Issues

An assessment of historical contamination issues together with details of the site's development history was carried out in previous desk studies as summarized below and in Appendix C4.

As the site has not yet commenced production, no contamination of the underlying subsoils or groundwater is expected to have occurred. However, historical contamination at the site has been characterized by intrusive investigation and contaminants beneath the site are known to include:

- Petroleum Hydrocarbons (fuel oil etc); and
- Chromium (though hexavalent chromium is below detection limits).

5.2 Preventative Measures

The pollution preventative measures (physical infrastructure and those relating to testing, inspection and maintenance) for each relevant activity associated with the potentially polluting substances have been identified and their extent and condition were assessed as part of the walkover survey of the site. A summary of the overall management of these preventative measures is discussed below.

Falcon Steel operates a comprehensive maintenance management system which is described in Section B2.8 of the main Application document. The management system includes quarterly visual inspections of:

- All bunded areas and drainage channels to detect any signs of deterioration, leaks, spillage or blockage. Any corrective action required is reported to and implemented by the Site Manager.

- Equipment in all process areas, to identify equipment wear and tear which need to be addressed as part of the company's planned/predictive maintenance programme. Particular attention is paid to pipework, tanks, supports, ducting, motors, pumps and filters, and compressed air.

Annual testing of bunded areas and drainage channels is also carried out including:

- Leak testing of all bunded areas.

- Detailed inspection of integrity of drainage channels.

As the site is not yet operational, the site does not currently have an Environmental Management System accredited to ISO 14001:2004. Site management have indicated that an environmental management system conforming to the requirements of ISO 14001:2004 will be implemented when the site is operational. Existing management procedures will be adopted from Alcoa and implemented in full within 6 months of commencement of operations at the site.

Existing management procedures implemented by Alcoa cover operational and maintenance systems to ensure all abatement (including bunds) and process technology is functioning as designed to avoid pollution. Ensuring continuous monitoring equipment and out-of-tolerance alarms are functioning.

5.3 Assessment of the likelihood of land pollution

Appendix D2 contains an assessment of the likelihood of environmental pollution from the installation. The information is presented in tabular form and addresses additional measures that Falcon Steel has implemented to prevent accidents and to limit any consequences.

The major risks to land pollution from hazardous materials used by Falcon Steel are:

- Hazardous liquid spillage and entry into groundwater or surface water during delivery of chemicals, storage or handling/movement around the site;

- Escape of hazardous waste materials to groundwater or surface water during storage or collection for off-site disposal;
- Release of hazardous materials to sewer above trade effluent consent limits from failure of the effluent batch tank treatment;
- Vandalism; and
- Fire.

The first two risks are minimised by locating all chemicals storage areas and hazardous wastes storage areas inside bunded areas. Deliveries of chemicals and collections of wastes are carried out by driving the collection or delivery vehicle to the relevant area and utilizing fork lift trucks.

Leakages within the process areas are unlikely. However, all process pipework and storage tanks are above ground within hardsurfaced areas which are not connected to drainage systems. As an example, foundation drawings held by Alcoa indicate that the coil preparation line is underlain by concrete up to 2085mm (2.085m) thick. A series of shallow sumps are present along the coil preparation line which lie within the concrete foundations. The drawings indicate that the sumps are lined with acid resistant brick and that the bases of the sumps do not exceed the thickness of the concrete.

Based on the information presented above, for all relevant activities at the installation there is little or no likelihood that land pollution or leaks to the land will occur during the future life of the installation.

It is the conclusion of this report that reference data for the site does not need to be collected.

6 Conceptual Site Model

6.1 Geology and Hydrogeology

The geological sequence beneath the site is as follows:

1. Made ground
2. Swansea Valley Fill
3. Alluvium
4. Boulder clay
5. Coal Measures

This can be seen in plan form in Appendix A2 and is detailed in Appendix C2.

6.1.1 Made Ground

The Made Ground has been observed to range from less than 1m thick to over 5m thick throughout the site. The Made Ground can be found as black, clayey ground or hardcore and hardstanding from an unknown period.

6.1.2 Swansea Valley Fill

The Swansea Valley Fill has been shown to comprise cobble size fragments of slag, furnace brick, concrete and wood fragments. The Swansea Valley Fill is assumed to be a minor aquifer and is present throughout the site at thicknesses of less than 1m to 4m. The Swansea Valley Fill on this part of the site is known to date from the 1930s.

6.1.3 Alluvium

The Alluvial clays, sands and gravels are classified as a minor aquifer. Shallow groundwater may be present within these deposits at a depth of 4m to 4.5m.

6.1.4 Boulder Clay

The Boulder Clay at the site has been proven to comprise grey sandy gravelly clays or stiff orange brown mottled grey sandy gravelly clay. The Boulder Clay is reported to be a negligibly permeable non-aquifer. The Boulder Clay is present throughout the site at depths of between 1m and 2m.

6.1.5 Coal Measures

The Coal Measures comprise weathered mudstones and sandstones and are classified as a minor aquifer. In some locations on the site they are less than 1m from the surface. The Coal Measures are present beneath the site to depth.

6.2 Surface Water Features

The surface water features in the vicinity of the site are shown on Appendix A3 and A4 and are as follows:

6.2.1 Gors Fawr Brook

The Gors Fawr Brook is located 510m west of the site at its closest point and flows in a north westerly direction. This watercourse is not classified under the Environment Agency's General Quality Assessment Scheme. No flow data for this watercourse was available.

Groundwater beneath the site is not in hydraulic continuity with the culverted tributary of the Gors Fawr Brook.

6.2.2 Afon Llan

The Afon Llan is located 310m north of the site at its closest point and flows in a westerly direction. The Afon Llan is classified as Grade A for chemical quality in 2000. According to the EA website, the Afon Llan was classified as Grade C for chemical quality in 2006. The flow of the Afon Llan at this point is reported to be less than 0.62 cumecs.

6.3 Results of Previous Investigations/Assessments

The following reports are available for the site. Copies of these reports are available on request. Appendix C5 shows a summary of the data

All analysis for the most recent ENVIRON intrusive report (report reference 64-C12930) was undertaken by ALcontrol Technichem, a UKAS and MCERTS accredited laboratory. Copies of the accreditation certificates for ALcontrol Technichem are provided in Appendix C5.

Table 6.1: Schedule of Reports

Title	Author	Date	Reference
Alcoa Manufacturing (GB) Limited Alcoa 816F Effluent Area Hydrogeological Study Phase I	Applied Geology (South Wales) Ltd	February 1992	30297/SR341
Phase 1 Interim Assessment Report for Site-Wide Hydrogeological Survey at Waunarlwydd Works, Swansea.	Geraghty and Miller International, Inc.	July 1993	NA
Site-Wide Hydrogeological Survey, Waunarlwydd Works, Swansea (Volume I: Text and Figures)	Geraghty and Miller International, Inc.	February 1994	ALCOAREP/JAN94/PR.acr
Site-Wide Hydrogeological Survey, Waunarlwydd Works, Swansea (Volume II: Appendices)	Geraghty and Miller International, Inc.	February 1994	ALCOAREP/JAN94/PR.acr
Alcoa Europe - Flat Rolled Products, Swansea, South Wales. Site Condition Report. Application for a Permit to Operate a Part A1 Installation under the Pollution Prevention and Control Regulations 2000	ENVIRON (UK) Ltd	November 2001	61-C5053A

Alcoa Manufacturing (GB) Ltd, Waunarlwydd Works, Swansea. Site Investigation	ExCAL	September 2002	
Alcoa Europe - Flat Rolled Products, Swansea, South Wales. Addendum to the ENVIRON Site Condition Report 15.11.01 Application for a Permit to Operate a Part A1 Installation under the Pollution Prevention and Control Regulations 2000	Natural Solutions	April 2004	ALCSW03F
Alcoa Global Business Shared Services: Additional Phase IIB Investigation Report, Alcoa Europe Extrusions and End Products, Waunarlwydd Works, Swansea	Arcadis Geraghty and Miller International, Inc.	January 2005	920740216
Phase I and II Environmental Assessment, Alcoa Mill Products, Waunarlwydd, Swansea	ENVIRON (UK) Ltd	November 2006	64-C10817
PPC Site Surrender Report: Part 2 – Surrender data, Alcoa Manufacturing (GB) Ltd, Waunarlwydd, Swansea Permit No. BM1377	ENVIRON UK Ltd	July 2007	64-C11647_3
PPC Surrender Remediation Action Plan, Alcoa Manufacturing (GB) Ltd, Waunarlwydd, Swansea, UK	ENVIRON UK Ltd	November 2007	64-C12564
Phase II Environmental Site Investigation, Coil Preparation Line, ALCOA Manufacturing (GB) Ltd, Waunarlwydd, Swansea, UK	ENVIRON UK Ltd	January 2008	64-C12930

6.4 Other Receptors

Figure A5 contains details of environmentally significant receptors within a 10km radius of the site.

A list of Sites of Special Scientific Interest (SSSI), Special Protection Areas, Special Areas of Conservation and RAMSAR sites within a 10km radius of the site is appended to Figure A5.

The site is not likely to have any significant effects on any designated sites due to the limited nature of emissions from the site. Furthermore, the proposed site activities have been undertaken at the subject site for many years with aluminium coils when operated by Alcoa, without disruption to any SSSI or European Site.

6.5 Land Pollution History

A number of historical maps were examined as part of the environmental review. The historical development of the site and surrounding area is summarised below. Selected historical maps are presented in Appendix C4.3.

The land use chronology shown on historical plans generally correlates with information obtained from Alcoa personnel on the sites historical development. The following overview has been formed from the available information:

The Alcoa plant was opened in the late 1930s by ICI for the manufacture of non-ferrous metals. The initial plant building was the main central area of the existing Alcoa plant.

At about the same time, land to the north end east of the ICI buildings was raised using Lower Swansea Valley Fill material (SVF) and the TIMET Ltd (formerly IMI Titanium) plant was built on marshland north of the ICI plant, again on raised ground using SVF.

In 1974, the main Alcoa plant building was extended northward and eastward to house the cold mill, coil preparation line, original coil coating line and shrink pack line. Fill was placed directly on glacial boulder clay. An 18m deep sump reportedly exists beneath the cold mill, and presumably was excavated into bedrock beneath the site.

In 1988/9 a new Coil Coating and Slitter was built. The original Coil Coating Line was removed in 1991/2.

6.6 Site Zoning

The site has been divided into a series of zones based upon the site setting and the possible (and actual) location of potentially polluting substances. These zones are shown on Appendix A7. Pollutant sources within each zone are shown as Appendix A6. Table D2 below has been split up on the basis of these Zones.

The zones have been delineated according to the discrete areas where hazardous materials are stored and used. In addition, the areas have been zoned due to the availability of baseline contamination data for these areas.

- Zone 1 – Coil Preparation Line – potential for leaks of chromate solution during use or storage.
- Zone 2 – Coil Coating Line – potential for leaks of process materials during coating operations.
- Zone 3 – Lacquer Storage Bulk Tanks – potential for contamination from spills or leaks during filling or storage.
- Zone 4 – Solvent Storage Bulk Tanks – potential for contamination from spills or leaks during filling or storage.
- Zone 5 – Pallet Store and Drum Compound – potential for contamination from spills in this area during storage and transport.
- Zone 6 – Effluent Batch Tanks – potential for contamination in the event of tank leakage.
- Zone 7 – Former Effluent Treatment Plant Area – baseline contamination data exists for this area.
- Zone 8 – Cold Mill Electrical Transformer Compound – baseline contamination data exists for this area.

6.7 Summary of Conceptual Site Model

6.7.1 Introduction

The findings of the desk study and site reconnaissance (detailed above) have been used to develop the conceptual site model (CSM) for the site. Uncertainties in the CSM are identified and their significance discussed.

6.7.2 Graphical Representation of the Site

Graphical representations of the CSM have been produced and are shown in Appendix E.

Hardstanding around the site was observed to be constructed of a mixture of concrete and asphalt. In general the hardstanding was observed to be in moderate to good condition with no significant cracking or traces of surface staining around process areas. At the time of the site walkover there is no pollution pathway through the hardstanding.

The main potential for future pollution pathways is considered to be via cracks should any areas of hardstanding subsequently degrade and be allowed to fall into disrepair.

It is considered extremely unlikely that any spillage of chemicals on site within bunded areas or internal to the building could overflow the bund wall or seep through the bund wall, as the impervious bund lining would prevent this. However, regular visual inspection of the bund wall and adequate preventative maintenance to assess any degradation at the earliest opportunity will take place once site operations have commenced.

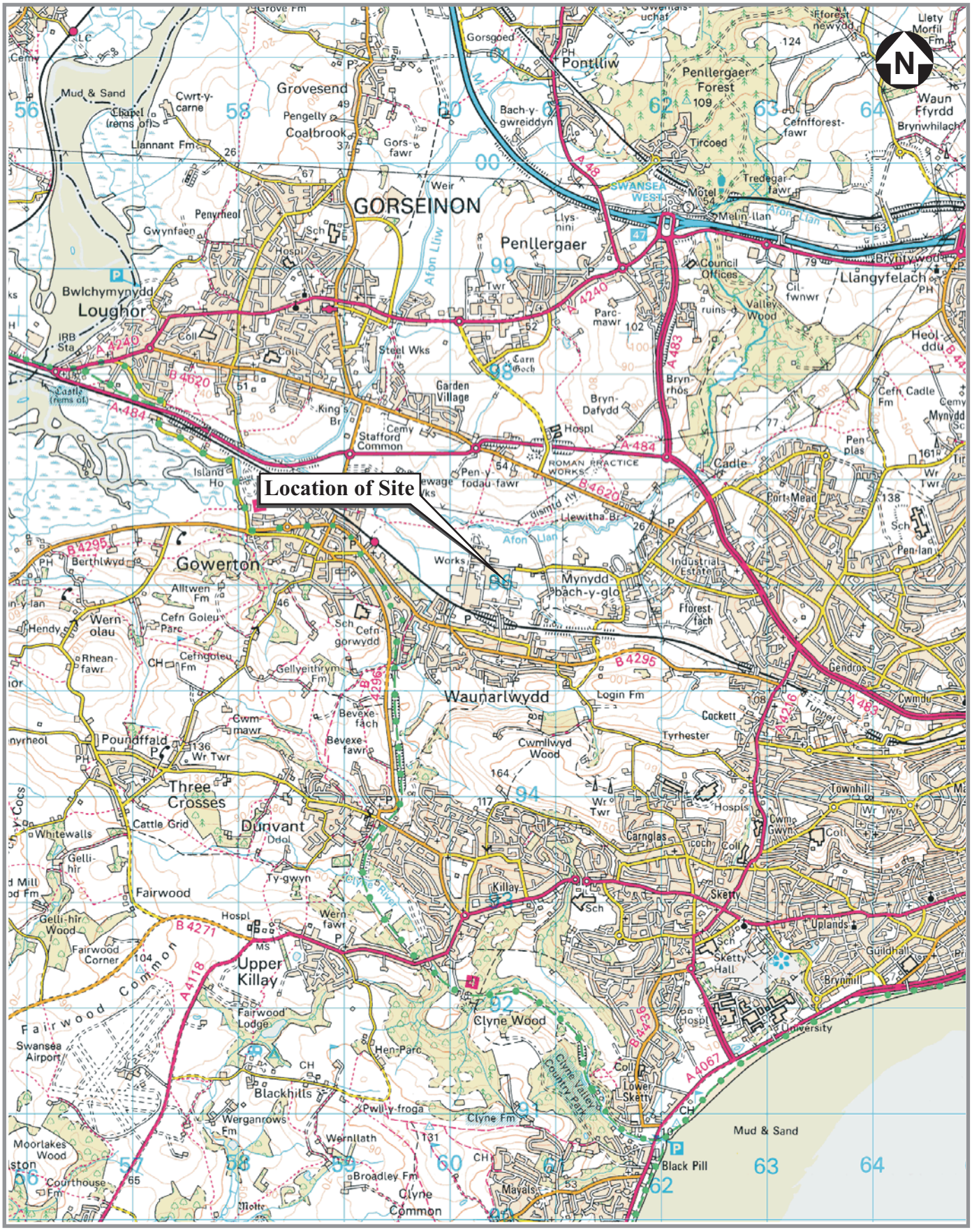
6.7.3 Uncertainties in the CSM

In developing the conceptual model for the site the following assumptions have been made:

- The composition of the geology beneath the site is as derived from excavations and boreholes beneath the site. The geology between the site and the Afon Llan is less well known.
- The ground under the site is a minor aquifer with a moderate leaching potential, in which diffuse pollutants and liquid discharges have the potential to move fairly rapidly.
- Local groundwater flow, through the alluvium, is unlikely to be in hydraulic continuity with the culverted tributary of the Gors Fawr Brook, which runs through the north of the site. Observations within the adjoining service trench which holds the gas main has shown no water ingress into the service trench, indicating the high integrity of the trench.
- Shallow groundwater is estimated to be at a depth of less than 3m below ground level.

Annex A: Figures and Maps

Figure A1
Site Location Plan



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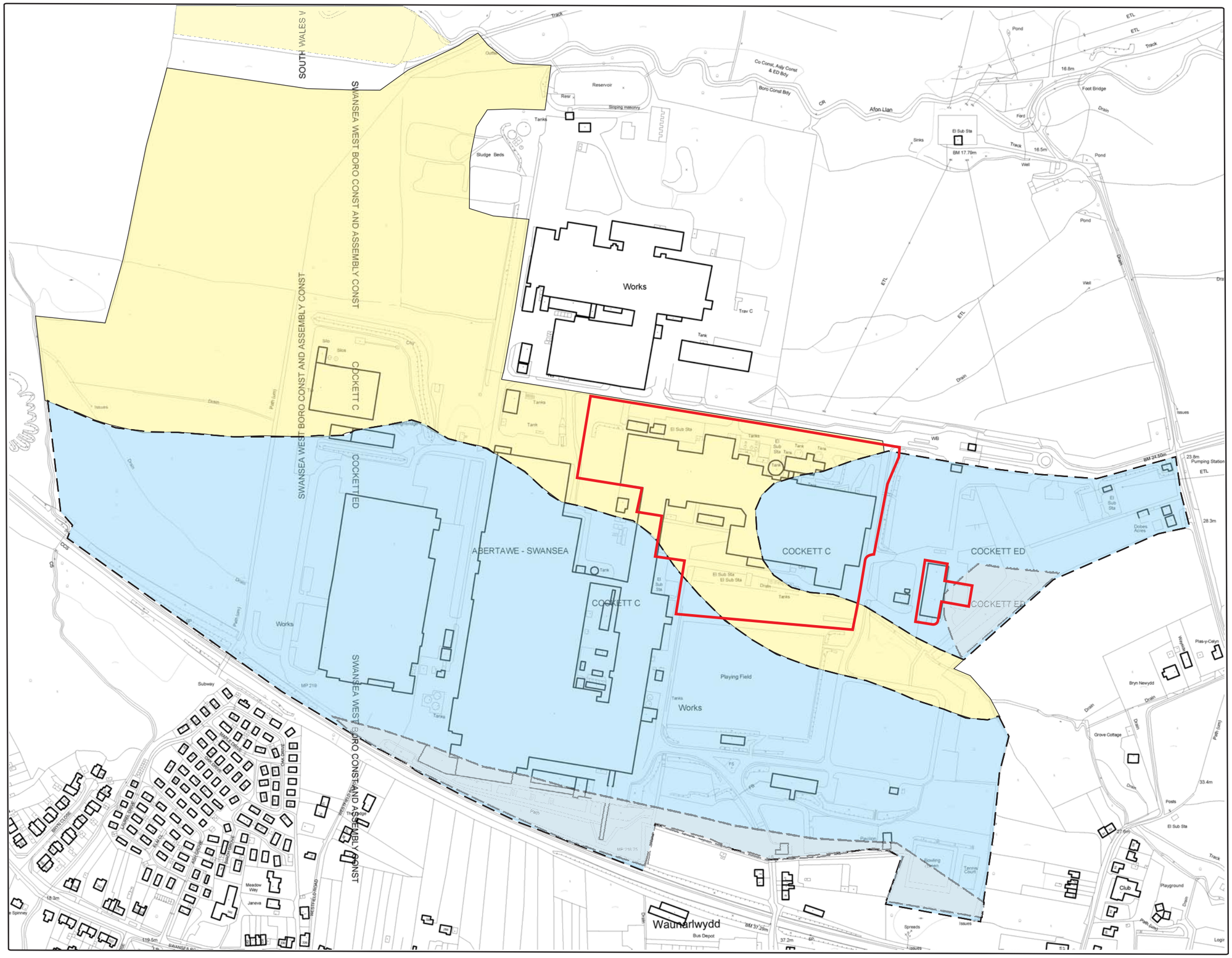
Client	**Falcon Steel Ltd**		
Scale	**1:50,000**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**



Legend

- Alluvium
- Boulder Clay
- Coal Measures
- Extrapolated Coal Outcrop
- Synclinal Axis (geological structural feature)

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Part A2 PPC Application
Falcon Steel Ltd, Waunarlwydd, Swansea

Figure A2
Simplified Geological Map of the Site

Client: Falcon Steel Ltd

Scale: 1:10,560

Project No.: 64-C13317

Date: May 2008

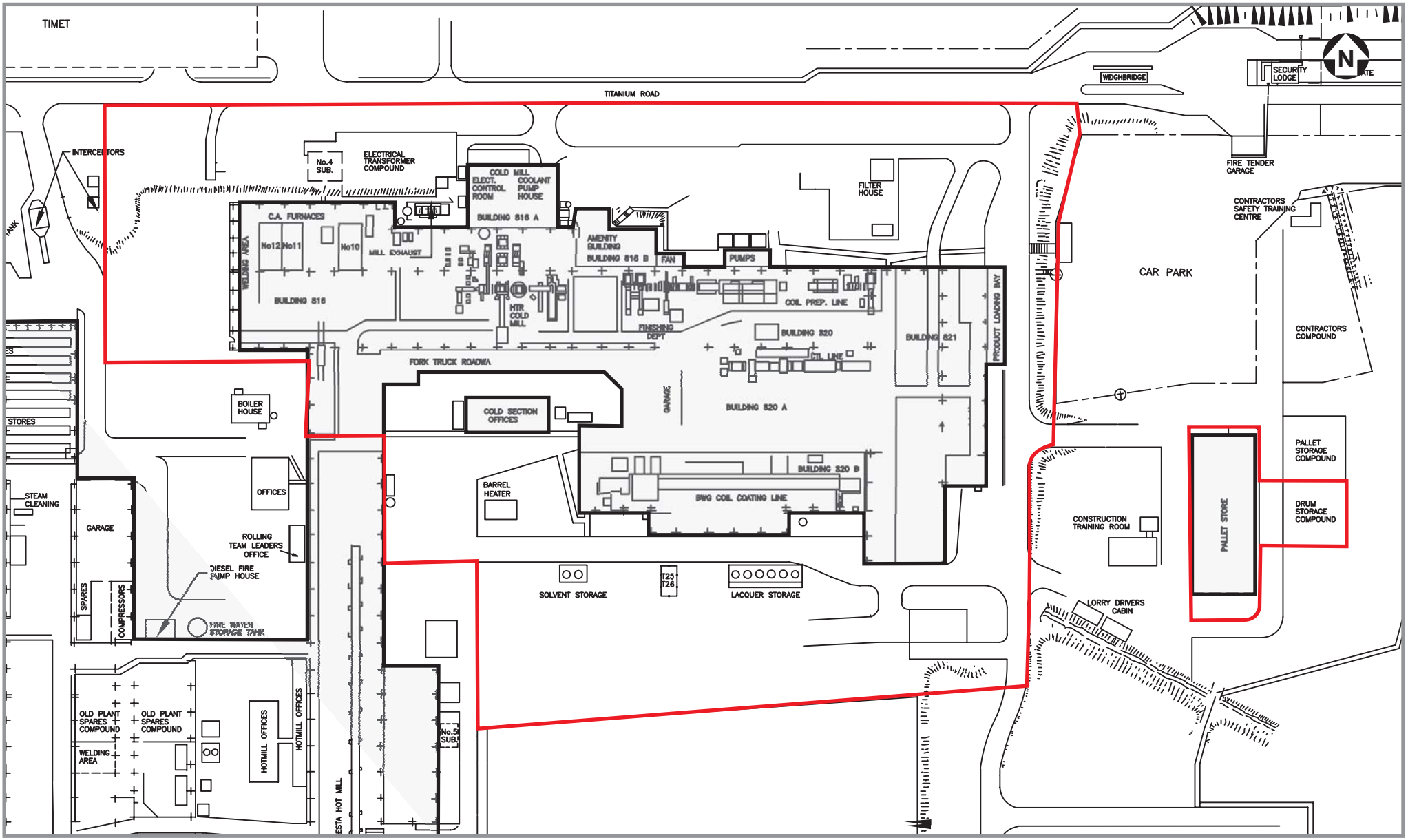

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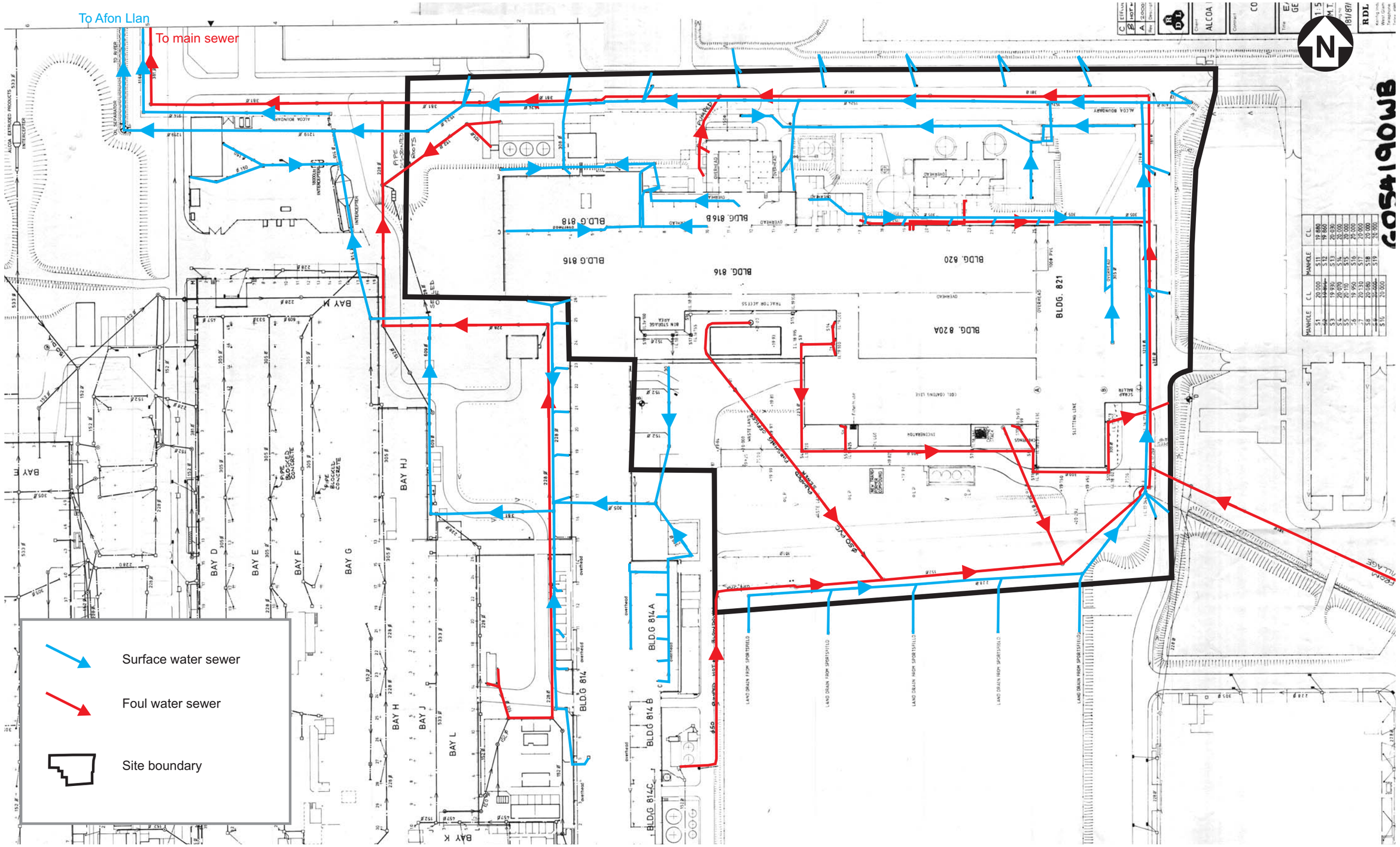
Figure A3
Site Layout

Client	**Falcon Steel Ltd**		
Scale	**NTS**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**



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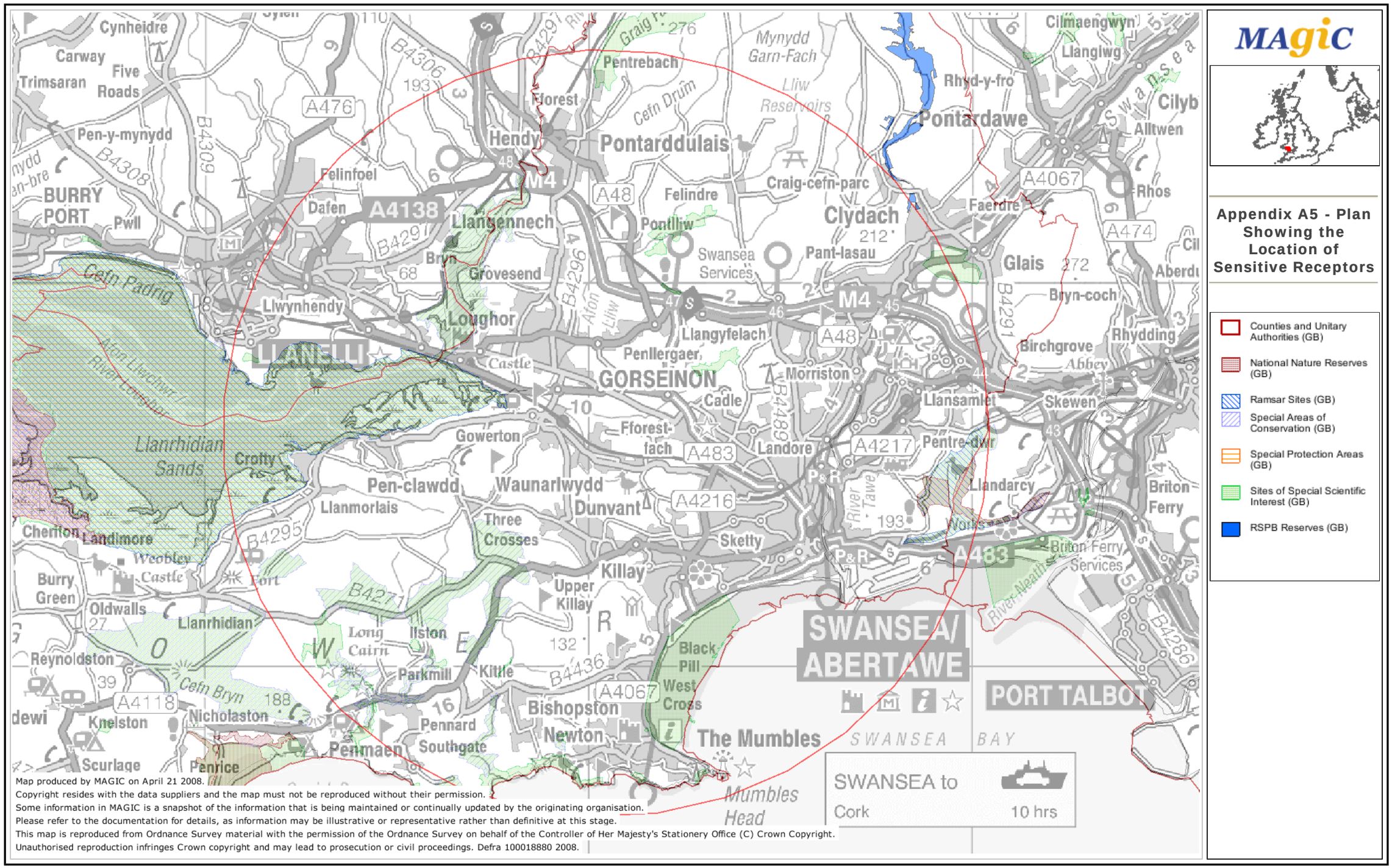
Title **Figure A4**

Site Drainage Plan

Client	**Falcon Steel Ltd**		
Scale	**NTS**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**


MAGIC
Appendix A5 - Plan Showing the Location of Sensitive Receptors
Counties and Unitary Authorities (GB)
National Nature Reserves (GB)
Ramsar Sites (GB)
Special Areas of Conservation (GB)
Special Protection Areas (GB)
Sites of Special Scientific Interest (GB)
RSPB Reserves (GB)
SWANSEA to Cork 10 hrs
Map produced by MAGIC on April 21 2008.
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Site Check Report

Report generated on April 21 2008.

You clicked on the point:
Grid Ref: SS 604 960
Full Grid Ref: 260445 , 196082

The following features have been found within 10,000 metres of your search point:

National Nature Reserves (GB)

Last Declaration Date	Name
Fri, 27 Sep 1991 00:00:00 UTC	CRYMLYN BOG AND PANT Y SAIS

Ramsar Sites (GB)

Reference	Name	Scale	Classified Date	Projection
UK14001	BURRY INLET	2500	Tue, 14 Jul 1992 00:00:00 UTC	OS GB GRID
UK14006	CRYMLYN BOG	2500	Tue, 8 Jun 1993 00:00:00 UTC	OS GB GRID

RSPB Reserves (GB)

Name
CWM CLYDACH (CURRENT BOUNDARY FROM 29/09/1995)

Sites of Special Scientific Interest (GB)

Last Notified	Northings	Name	SSSI Code	Confirmation Date	Eastings	First Notified
	189963	BARLAND COMMON STREAM SECTION, BISHOPSTON	33WCE	Thu, 20 Oct 1988 00:00:00 UTC	257803	29/03/1988
	188025	BISHOP'S WOOD	33WPW	Fri, 28 Nov 2003 00:00:00 UTC	259258	20/03/2003
	189841	BLACKPILL, SWANSEA	33WAM		262700	22/06/1984
Thu, 29 May 1986 00:00:00 UTC	187120	BRACELET BAY	33WWK		262927	01/01/1964
Mon, 25 Sep 1989 00:00:00 UTC	197738	BURRY INLET AND LOUGHOR ESTUARY	33WWL		244342	01/01/1972
Wed, 19 Jan 1983 00:00:00 UTC	187248	CASWELL BAY	33WWM		258178	01/01/1972
Mon, 31 Mar 2003 00:00:00 UTC	190189	COEDYDD PARKMILL A CWM LLETHRID/PARKMILL WOODLANDS	33WWX	Fri, 19 Dec 2003 00:00:00 UTC	253520	01/01/1961
Thu, 20 Mar 2003 00:00:00 UTC	194750	CORS CRYMLYN / CRYMLYN BOG	33WWP		269426	01/01/1975
	190968	COURTHOUSE GRASSLANDS	33WAJ	Wed, 16 Apr 2003 00:00:00 UTC	256031	25/07/2002
Tue, 7 Mar 1995 00:00:00 UTC	191896	FAIRWOOD, PENGWERN AND WELSHMOOR COMMONS	33WWR		256156	01/01/1972
Tue, 28 Oct 1986 00:00:00 UTC	200466	GLAIS MORAINE	33WWS	Fri, 10 Jul 1987 00:00:00 UTC	269472	01/01/1979
Thu, 30 Jun 1983 00:00:00 UTC	206746	GRAIG FAWR, PONTARDULAIS	33WXV		261822	01/01/1979
Wed, 28 May 1986 00:00:00 UTC	190567	ILSTON QUARRY	33WWV		255458	01/01/1958
	187070	LANGLAND BAY (ROTHERSLADE)	33WEX	Thu, 28 Nov 1996 00:00:00 UTC	261289	18/03/1996
	201548	NANT Y CRIMP	33WML		262249	11/07/2002
Thu, 22 May 1986 00:00:00 UTC	188338	OYSTERMOUTH OLD QUARRY	33WXC		261502	01/01/1958
Fri, 27 Feb 1987 00:00:00 UTC	188440	PENARD VALLEY	33WXD	Mon, 12 Oct 1987 00:00:00 UTC	254243	01/01/1972
	199830	PENLLERGAER RAILWAY CUTTING	33WDQ	Mon, 26 Feb 1990 00:00:00 UTC	262135	12/06/1989
Fri, 18 Dec 1992 00:00:00 UTC	197938	PENPLAS GRASSLANDS	33WHF	Fri, 10 Sep 1993 00:00:00 UTC	263455	18/12/1992

Tue, 24 Dec 1985 00:00:00 UTC	187760	PWLL-DU HEAD AND BISHOPSTON VALLEY	33WXE		256983	01/01/1959
	198050	PYLLAU MACHYNYS (MACHYNYS PONDS)	32WAF	Wed, 1 Sep 1993 00:00:00 UTC	251182	19/01/1993
	191420	ROSE COTTAGE, LLETHRID	33WAP	Wed, 20 Nov 2002 00:00:00 UTC	253126	28/02/2002

Special Areas of Conservation (GB)

Reference	Date Notified	Marine	National Grid Reference	Name
UK0020020	13/12/2004	Y	SS357991	CARMARTHEN BAY AND ESTUARIES / BAE CAERFYRDDIN AC
UK0012885	13/12/2004	N	SS694947	CRYMLYN BOG / CORS CRYMLYN
UK0030157	13/12/2004	N	SS573882	GOWER ASH WOODS / COEDYDD YNN GWYR
UK0012685	13/12/2004	N	SS497900	GOWER COMMONS / TIROEDD COMIN GWYR
UK0014787	13/12/2004	Y	SR885969	LIMESTONE COAST OF SOUTH WEST WALES / ARFORDIR CAL

Special Protection Areas (GB)

Name	Projection	Scale
BURRY INLET	OS GB GRID	2500

To save the report, select "Save" or "Save As" from the File menu. You should save the file with a **.html** extension and give it a name of your choice.
You can then open your report using your web browser software.

Print Report | Close Window

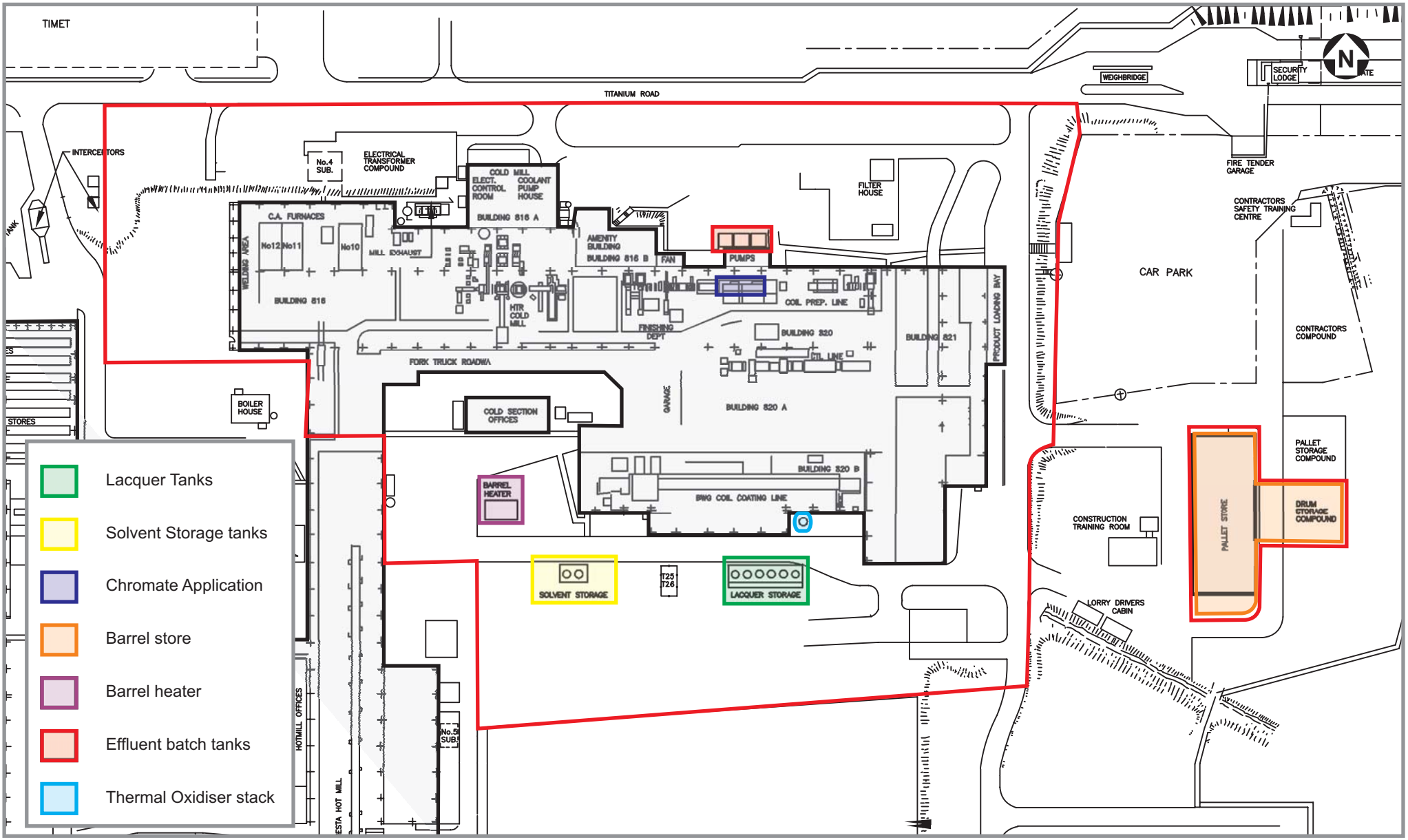

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Figure A6
Locations of Contaminant Sources

Client	**Falcon Steel Ltd**		
Scale	**NTS**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**

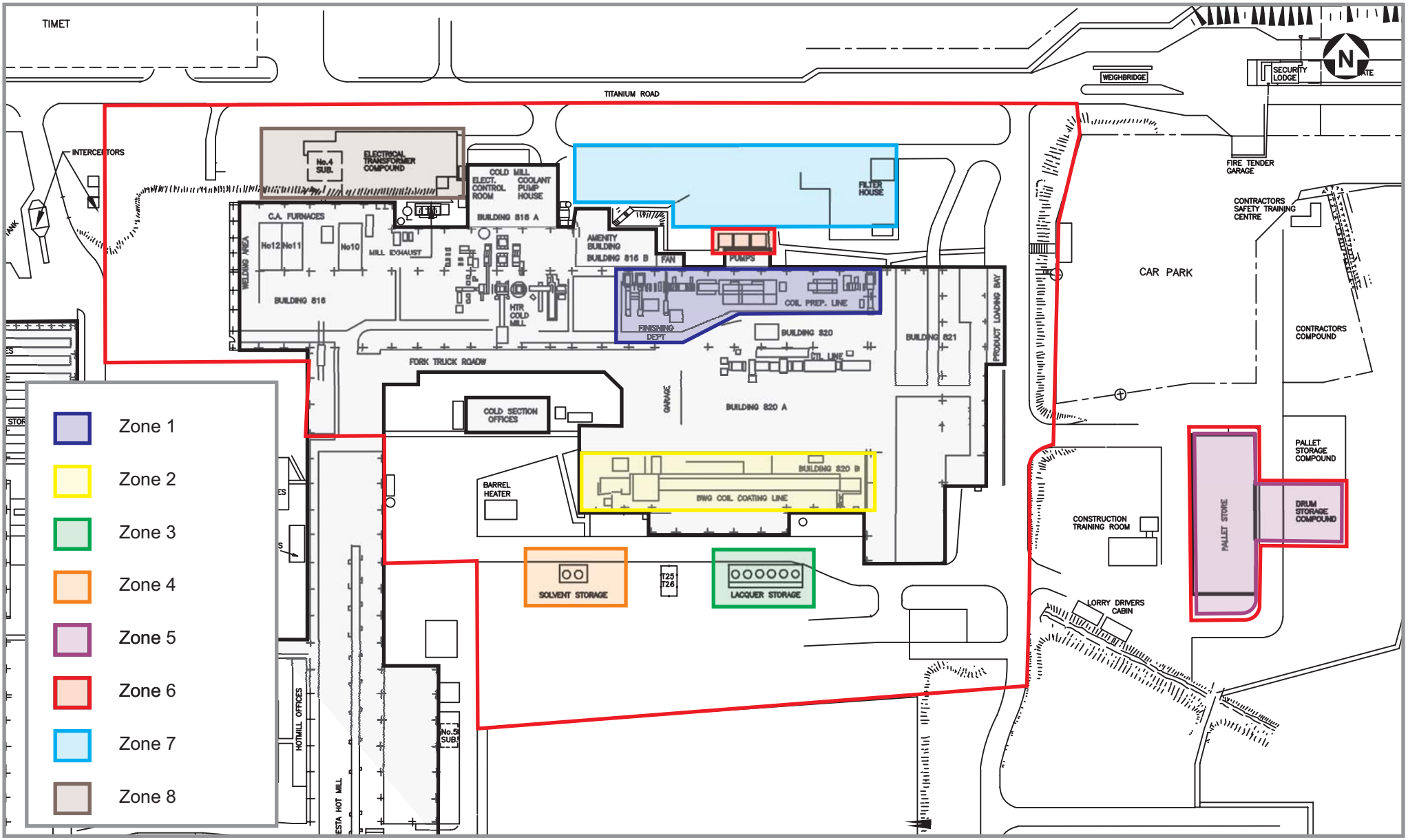

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Figure A7
Designated Zones at the site

Client	**Falcon Steel Ltd**		
Scale	**NTS**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**

Annex B: Site Reconnaissance

Photo 1: Coil preparation line

Photo 2: Coil coating line

Title:	Application Site Report	**Approved:** MR	**Project-No.:** 64-C13317	**Date:** May 2008
Site:	Falcon Steel, Waunarlwydd Works			
Client:	Falcon Steel Ltd	ENVIRON		**Appendix A**

Photo 3: Solvent bulk storage tanks

Photo 4: Lacquer bulk storage tanks

Title:	Application Site Report	**Approved:** MR	**Project-No.:** 64-C13317	**Date:** May 2008
Site:	Falcon Steel, Waunarlwydd Works			
Client:	Falcon Steel Ltd	ENVIRON		**Appendix A**

Photo 5: Thermal oxidizer stack

Photo 6: Barrel heater

Photo 7: Current view of the barrel storage area

Photo 8: Pallet store

Photo 9: Rear view of the concrete effluent batch tanks. Surrounding area to be concreted.

Photo 10: Pumped effluent discharge point to main sewer.

Annex C: Desk Study Information

C1 ENVIRONMENTAL CONSENTS, LICENSES, AUTHORISATIONS AND PERMITS FOR SITE AND SURROUNDING AREA

C1.1 Discharge Consents

The site has applied to Dwr Cymru Welsh Water for a discharge consent. It is the expectation that the consent parameters will be similar to those specified within the discharge consent held by Alcoa when the coil preparation line was previously active. The former Alcoa consent to discharge trade effluent to foul sewer, granted by Dwr Cymru on 8th October 2005 (consent number BC0012101) had the following parameters:

Parameter	Threshold
Maximum daily discharge	600 m^3
Maximum hourly discharge	40 m^3
Maximum temperature	43°C
pH range	6.0 to 10.0
Total suspended solids	500 mg/l
Total sulphate (expressed as SO4)	2000 mg/l
Total chromium	2 mg/l
Total copper	2 mg/l
Total Nickel	2 mg/l
Total zinc	2 mg/l
Total lead	2 mg/l
Total sulphide	4 mg/l
Total ammoniacal nitrogen	150 mg/l

The Envirocheck database holds ten (10) records of current discharge consents within a 1km radius of the site. The closest of which is held by Alcoa Manufacturing (GB) Ltd at a point 32m north west of the site to an unnamed tributary of the Gors Fawr Brook. This appears to be the trade effluent consent detailed in the above table.

C1.2 Waste Management Licences

There are two historical landfill sites within a 1km radius of the site:

- The former Alcoa Manufacturing (GB) Ltd landfill located 140m west of the site is classified as a Historic Landfill. This medium sized industrial landfill was recorded as being inactive as of November 1988.

- The Historic Landfill record relating to a landfill operated by Imperial Metal Industries Limited at a point 199m north west of the site is also recorded as being active and being operated as an industrial waste landfill by Timet UK Ltd.

There are two registered landfill sites within a 1km radius of the site:

- Alcoa Manufacturing (GB) Ltd 175m west of the site as a closed (September 1977) small landfill accepting inert pyrophoric wastes.

- I.M.I (Kynoch) Ltd 268m north of the site as an operational small landfill accepting inert pyrophoric wastes.

There is one registered waste treatment or disposal site 320m north of the site operated by I.M.I (Titanium) Ltd as an operational large storage lagoon. Authorised waste is limited to production sludge.

C1.3 Abstraction Licences

The database holds two records of licensed surface water abstractions within 2km of the site. The closest abstraction is located 347m north of the site from the Afon Llan for the abstraction of cooling water for non-evaporative cooling processes within the metals industry. This abstraction is licensed to Alcoa Manufacturing (GB) Ltd.

The only other abstraction is located 1.65km north west of the site, from the Afon Llan for the abstraction of make up or top up water (amenity). This abstraction is licensed to Bromham Leisure Ltd.

There are no licensed groundwater abstractions within 2km of the site.

C1.4 IPC Authorisations and PPC Permits

There is one company which operates under an IPC authorisation within 1km of the site. Imco Recycling (UK) Ltd, located 4m west of the site for “Non-ferrous metal processes within the metal industry” (Section 2.2 A (A));

There are three recorded IPPC permits within 1km of the site. The closest of these is located 44m west of the site for Alcoa Manufacturing (GB) Ltd, for “Non-ferrous metals: melting with capacity greater than 4T/D Lead/Cadmium or 20T/D Others” (Section 2.2 A(1) (B) (i).

C2 BOREHOLE DATA

Borehole data from the British Geological Survey (BGS) was deemed to be not representative of the site conditions. The closest BGS borehole was located 307m north west of the site.

ENVIRON had previously drilled boreholes throughout the site during the permit surrender and remediation works at the former Alcoa facility.

The following section contains a summary of the site geology gathered from desk based information and previous investigations.

Northern portion of the site

The north of the site is underlain by Made Ground which ranged from less than 1m thick to in excess of 4.0m thick in the north west corner.

The Made Ground in the south and west of the former effluent treatment plant was generally found to comprise hardstanding or grass overlying black sandy ash, considered to represent Swansea Valley Fill (SVF).

In the south east of the former effluent treatment plant the SVF was found to be a relatively thin layer (up to half a meter thick), overlying drift deposits of Boulder Clay (stiff orange brown mottled grey sandy gravelly clay) proven to between 1.3m and 1.9m bgl), further underlain by weathered mudstone of the Coal Measures.

The SVF thickened to the north west, reaching a maximum thickness of 4.0m. It was also found to contain more frequent cobble size fragments slag, furnace brick, concrete and wood fragments in the west. The SVF in the west was underlain by reworked clay.

Borehole locations at the western base of the embankment (MW9 and MW16 to MW18) encountered Made Ground between 0.5m and 3.0m thick comprising sandy gravelly clay with brick, concrete and metal fragments, underlain by a thin horizon of alluvium (yellow sandy clay), further underlain by Boulder Clay (grey sandy gravelly clay). Sandstone bedrock was encountered in the south at 5.0m bgl, while weathered mudstone was present further north between 3.5m and 3.8m bgl.

Bulk Storage Tank Farm

Ground conditions in the south of the tank farm comprised a relatively thin layer of Made Ground (less than 1m thick) directly overlying the Coal Measures, comprising weathered mudstones and locally weathered sandstone.

Ground conditions generally comprised hardstanding or grass overlying a relatively thin layer (up to 1.0m thick) of SVF, further underlain by re-worked firm to stiff grey/brown sandy

gravelly clay with fragments of brick, coal and clinker. The reworked clay was generally present to between 2.0m and 3.5m underlain by a thin horizon of silt/clay (former topsoil horizon, further underlain by firm grey mottled orange brown to olive sandy silt/clay to clay). The Coal Measures were proven between 5.0m bgl and 6.5m bgl.

There was no evidence of former structures associated with the tank farm.

Trial pits in the vicinity of the former M1 Mill Tank farm (TP94 and TP95) were terminated at shallow depths (1.1m and 1.4m bgl respectively) due to a rapid ingress of oily water from just below the concrete hardstanding.

Former Cold Mill areas

Swansea Valley Fill was encountered underlying the hardstanding, comprising dense gravels with occasional brick and concrete fragments to depths of between 1.8m and 3.2m bgl.

Dense granular Made Ground was also encountered to depths of between 1.3m and 3.0m bgl in the vicinity of the cold mill filter house and cold mill tank farm (both no longer present), and between 0.55m and 2.6m bgl in the vicinity of the former effluent treatment plant, likely to relate to their construction.

Black clayey Made Ground approximately 3.3m thick was identified in the north eastern corner of the site.

Generally, in the northern portion of the site, the Made Ground was underlain by alluvial clays to approximately 4.0 to 4.5m bgl, further underlain by sands and gravels (potentially alluvial or Boulder Clay deposits). Weathered mudstone was proven at 4.0m bgl in the area of the former effluent treatment plant.

Borehole locations in the vicinity of the cold mill cellars encountered a deeper thickness of Made Ground (between 4.0m and 5.3m thick) associated with the construction of the cellars. Alluvium was encountered in locations on the northern side of the cellars, present to a maximum depth of 7.0m bgl. The base of cellars lies within the Coal Measures.

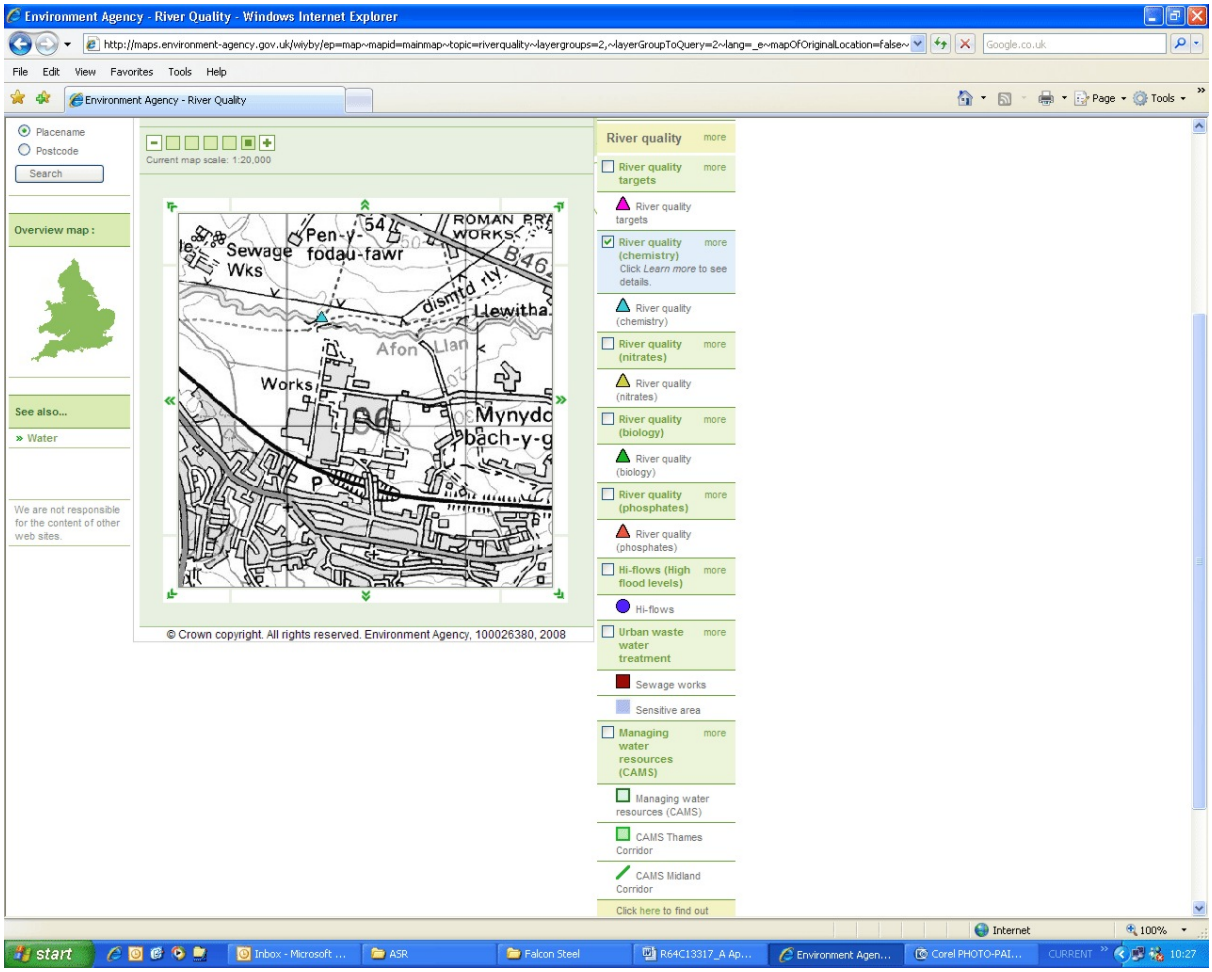
C3 HYDROLOGICAL AND HYDROGEOLOGICAL DATA

Hydrological and hydrogeological data was gathered from the Environment Agency's (EA) website (www.environment-agency.gov.uk) and also the Envirocheck database.

To access the information on the EAs website, please refer to the 'What's in Your Backyard' pages of the website and navigate to the site grid reference (260440, 196070). For completeness the information is reproduced below:

River Quality

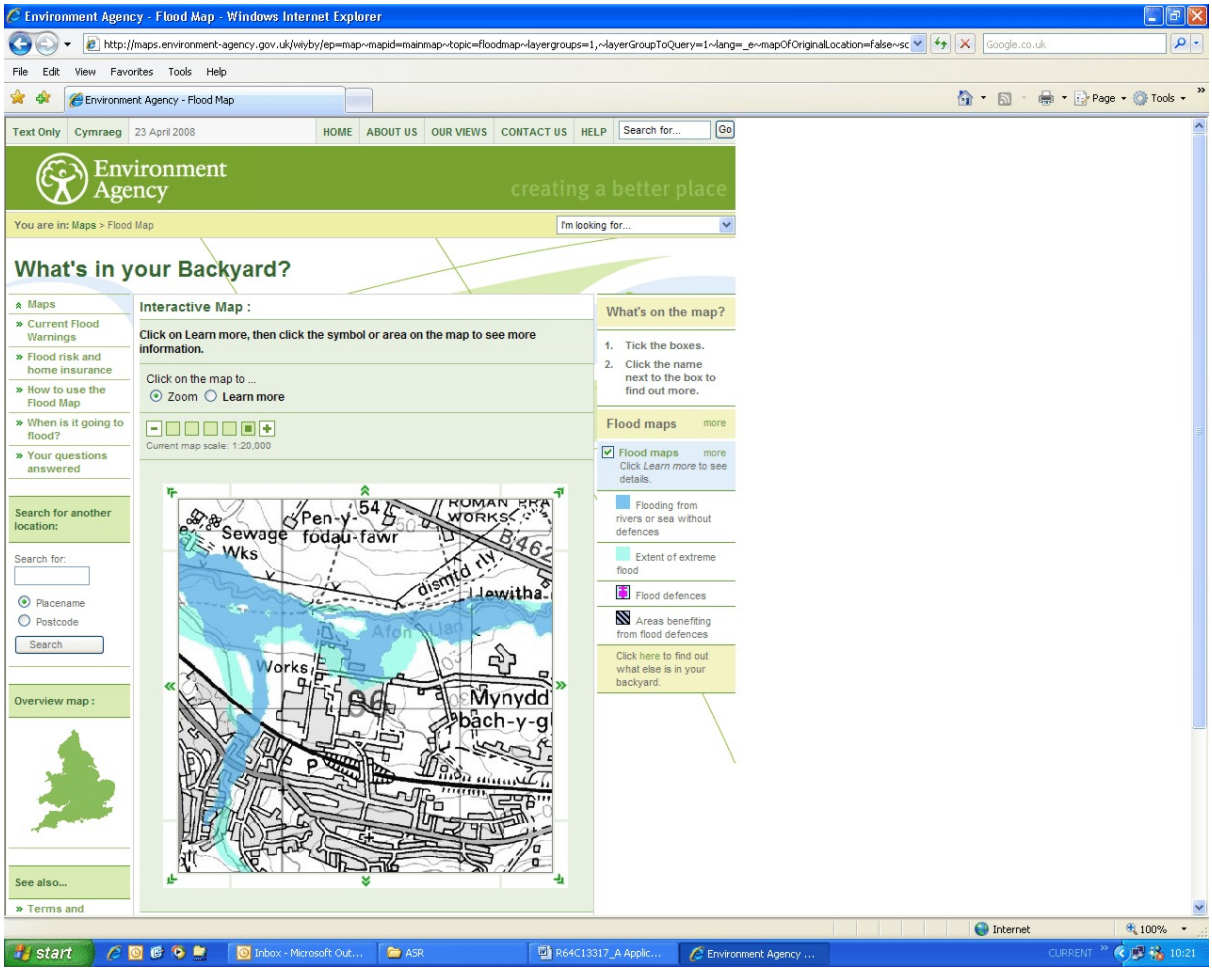
There is one surface water quality monitoring point within 500m of the site. This 5.2km stretch on the Afon Llan is referred to as the "Alcoa outlet – Melin Llan Br.Llangafelach" and is located 127m north of the site.



The Afon Llan at this point is classified under the Environment Agency General Quality Assessment (GQA) Scheme as Grade C for chemical quality in 2006.

Flood Risk

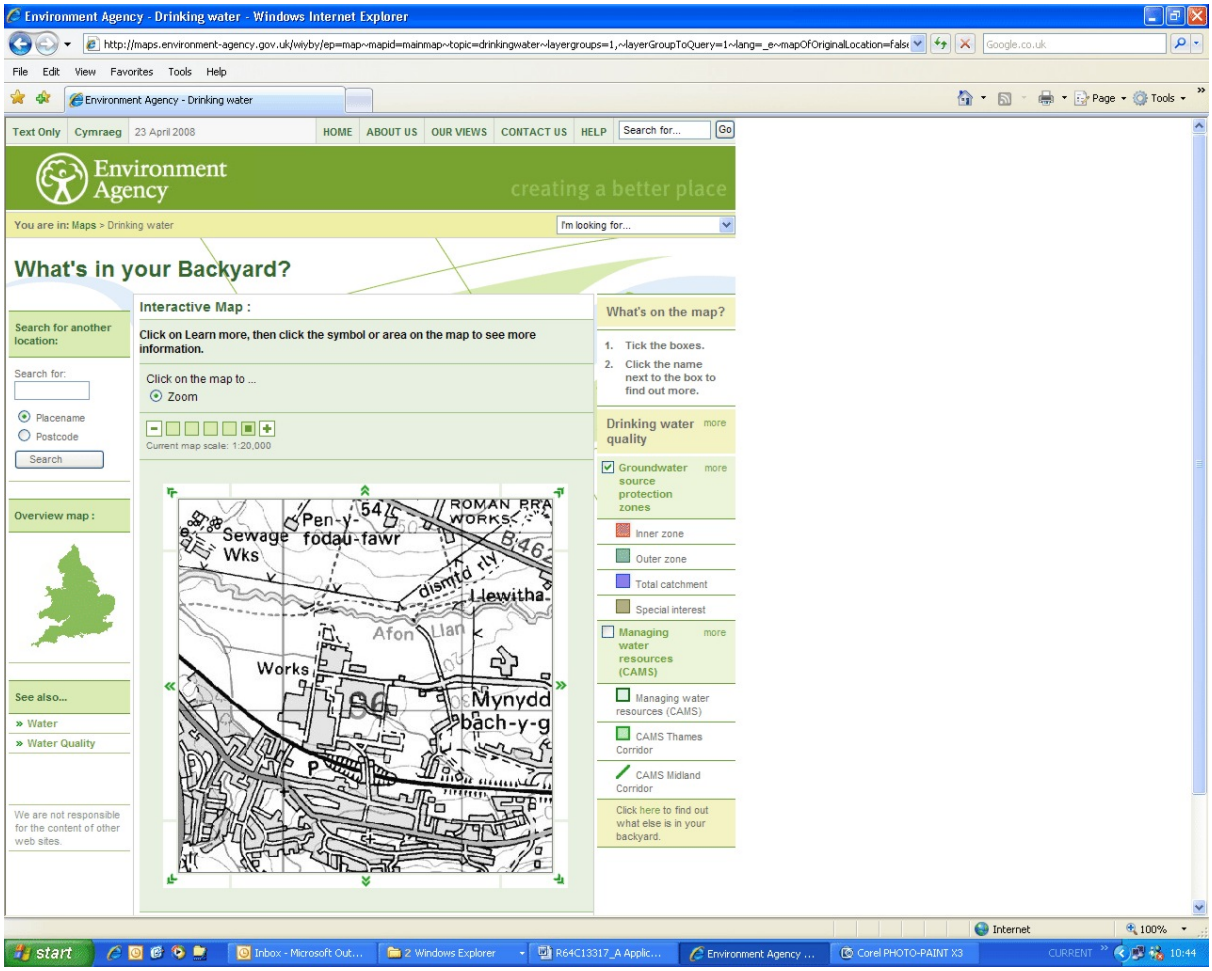
The site is in an area that has a significant chance of flooding. The chance of flooding each year is greater than 1.3% (1 in 75). This takes into account the effect of any flood defences that may be in this area, whether or not these are currently illustrated on the Flood Map.



According to site personnel, the site has never been subject to flooding events.

Groundwater Source Protection Zones

According to the Environment Agency the site does not lie within a currently designated groundwater source protection zone.


Environment Agency - Drinking water - Windows Internet Explorer
Environment Agency
creating a better place
What's in your Backyard?
Interactive Map :
Click on Learn more, then click the symbol or area on the map to see more information.
What's on the map?
Drinking water quality
Groundwater source protection zones
Managing water resources (CAMS)
Pen-y-fodau-fawr
Sewage Wks
ROMAN BRA WORKS
Afon Llan
Works
Mynydd
bach-y-g

C4 POLLUTION INCIDENTS TO LAND AND CONTROLLED WATERS

C4.1 Pollution Incidents to Controlled Waters

According to the Envirocheck database there has been one pollution incident to controlled waters within a 250m radius of the site. This incident occurred on 24th July 1997 at a point 76m north west of the site and involved the release of chlorinated water to a tributary of the River Llan. It was designated as a category 3 – minor incident. A further 25 incidents have occurred within a 1km radius, of which the majority were classified as category 3 incidents.

C4.2 Substantiated Pollution Incident Register

There have been three incidents recorded on the substantiated pollution incident register, within a 1km radius of the site. The closest of these occurred 609m east and was deemed to be a category 2 incident – significant incident with regards to land impact – and a category 3 incident – minor incident with regards to air impact. The pollutant involved was specified to be ammonia solutions.

C4.3 Historical Potential for Pollution

Historical land uses of the site and surroundings are detailed within Section 6.5.1 of this report. Selected historical maps are presented in the following pages.

C5 EXISTING SITE INVESTIGATION, ASSESSMENT AND REMEDIATION RECORDS

The following reports and documents are available for the subject site:

Table C.15: Schedule of Reports			
Title	**Author**	**Date**	**Reference**
Alcoa Manufacturing (GB) Limited Alcoa 816F Effluent Area Hydrogeological Study Phase I	Applied Geology (South Wales) Ltd	February 1992	30297/SR341
Phase 1 Interim Assessment Report for Site-Wide Hydrogeological Survey at Waunarlwydd Works, Swansea.	Geraghty and Miller International, Inc.	July 1993	NA
Site-Wide Hydrogeological Survey, Waunarlwydd Works, Swansea (Volume I: Text and Figures)	Geraghty and Miller International, Inc.	February 1994	ALCOAREP/JAN94/PR.acr
Site-Wide Hydrogeological Survey, Waunarlwydd Works, Swansea (Volume II: Appendices)	Geraghty and Miller International, Inc.	February 1994	ALCOAREP/JAN94/PR.acr
Alcoa Europe - Flat Rolled Products, Swansea, South Wales. Site Condition Report. Application for a Permit to Operate a Part A1 Installation under the Pollution Prevention and Control Regulations 2000	ENVIRON (UK) Ltd	November 2001	61-C5053A
Alcoa Manufacturing (GB) Ltd, Waunarlwydd Works, Swansea. Site Investigation	ExCAL	September 2002	
Alcoa Europe - Flat Rolled Products, Swansea, South Wales. Addendum to the ENVIRON Site Condition Report 15.11.01 Application for a Permit to Operate a Part A1 Installation under the Pollution Prevention and Control Regulations 2000	Natural Solutions	April 2004	ALCSW03F
Alcoa Global Business Shared Services: Additional Phase IIB Investigation Report, Alcoa Europe Extrusions and End Products, Waunarlwydd Works, Swansea	Arcadis Geraghty and Miller International, Inc.	January 2005	920740216
Phase I and II Environmental Assessment, Alcoa Mill Products, Waunarlwydd, Swansea	ENVIRON (UK) Ltd	November 2006	64-C10817
PPC Site Surrender Report: Part 2 – Surrender data, Alcoa Manufacturing (GB) Ltd, Waunarlwydd, Swansea Permit No. BM1377	ENVIRON UK Ltd	July 2007	64-C11647_3
PPC Surrender Remediation Action Plan, Alcoa Manufacturing (GB) Ltd, Waunarlwydd, Swansea, UK	ENVIRON UK Ltd	November 2007	64-C12564
Phase II Environmental Site Investigation, Coil Preparation Line, ALCOA Manufacturing (GB) Ltd, Waunarlwydd, Swansea, UK	ENVIRON UK Ltd	January 2008	64-C12930

C5.1 Summary of contamination and remediation.

Except where specified, these results are taken from the July 2007 Final PPC Surrender report prepared by ENVIRON (Reference R64C11647_3). These reports can be provided on request.

ZONE 1 – COIL PREPARATION

Soil Analysis Results

Metals were detected in soil samples recovered from Zone 1, including arsenic (maximum concentration of 18 mg/kg at 1.2-1.5m in BH18_01), barium (maximum concentration of 140 mg/kg at 2.0m in BH18_01), beryllium (maximum concentration of 1.2 mg/kg at 2.0m in BH18_01), boron (maximum concentration of 0.5 mg/kg at 1.2-1.5 in BH18_01), chromium (maximum concentration of 37 mg/kg at 3.0m in BH18_02), copper (maximum concentration of 120 mg/kg at 5.0m in BH18_02), lead (maximum concentration of 44 mg/kg at 4.5m in BH18_01), nickel (maximum concentration of 31 mg/kg at 2.0m in BH18_01), vanadium (maximum concentration of 22 mg/kg at 2.0m in BH18_01) and zinc (maximum concentration of 98 mg/kg at 1.2-1.5m in BH18_01).

Soil from the site contained sulphate (maximum concentration of 2,200 mg/kg at 1.2-1.5m in BH18_01) and organic carbon (0.93% at 2.0m in BH18_01). There was no hexavalent chromium detected in any of the soil samples and the pH ranged between 5.5 (at 4.5 m bgl in BH18_01) and 8.1 (at 1.2-1.5 m bgl in BH18_01).

EPH (C10-C40) were detected in four soil samples and reached a maximum concentration of 110 mg/kg at 1.2-1.5m bgl in BH18_01.

No PAHs or VOCs were detected in any soil sampled from Zone 1.

Groundwater Analysis Results

Groundwater samples from Zone 1 were found to contain metals including boron (maximum concentration of 0.051 mg/l in BH18_01), nickel (0.008 mg/l in BH18_02) and zinc (0.009 mg/l in BH18_02). The pH of the groundwater from BH18_01 and BH18_02 were 6.3 and 6.2, respectively.

The EPH (C10-C40) concentrations in the groundwater sampled from BH18_01 and BH18_02 were 0.08 mg/l and 0.04 mg/l, respectively.

No PAHs or VOCs were detected in any groundwater sampled from Zone 1.

Data from R64C12930 (Phase II Investigtion of Coil Preparation Line (CPL))

Comparison of the analytical results against Tier 1 screening criteria for human health (based on a commercial end use) and Controlled Waters has not identified significantly elevated concentrations of contaminants in the soil or groundwater in the vicinity of the CPL.

Importantly, concentrations of total chromium in soils were low, ranging from 17mg/kg to 33mg/kg. These were similar to the concentrations detected in BH18_01 and BH18_02

during the PPC site surrender investigation. They are also much lower than the concentrations detected within the footprint of the ETP, where total chromium ranged from 780mg/kg to 10,000mg/kg.

Hexavalent chromium was below laboratory reporting limits in all soil and groundwater samples analysed in this investigation. Again, this is much lower than the concentrations detected in soils in the footprint of the ETP, which ranged from 6mg/kg to 430mg/kg.

Therefore, these results indicate that the use of chromium compounds (including hexavalent chromium) in the CPL has not significantly impacted soil or groundwater underlying the CPL. The data collected during this investigation also indicates that the chromium contamination underlying the ETP has not resulted from the lateral migration of chromium contamination in groundwater from the CPL.

ZONE 2 – COIL COATING LINE

There is no available reference data for this area.

ZONE 3 – LACQUER STORAGE BULK TANKS

Soil Analysis Results

Observations of Historical Contamination

During the excavation at the eastern end of the tank farm, a strip of wet ballast (potentially a drainage channel) was encountered at approximately 0.5m bgl, running east to west approximately 2m south of the bund wall. The ballast had a hydrocarbon odour and black staining, but no solvent odour. The Made Ground above the channel (VS91) recorded slightly elevated concentrations of m,p-xylenes (2.4mg/kg) and o-xylenes (1.1mg/kg). In addition, various PAHs were also detected. With the exception of naphthalene, PAHs were not detected in Zone 4 during the Surrender Data investigation or in the other validation samples. This, together with field observations of the contamination being a heavy hydrocarbon not used in the current process, confirmed that it was historical contamination, and the stained ballast drain was not excavated as part of the PPC remedial works.

The results of the final validation samples are presented in Annex C and laboratory certificates are available on request. The final condition of the soils in the remediated area are summarised in the table below.

Table 5.2: Summary of Soil Condition, Zone 4

Determinand	Concentration range following remediation (mg/kg)
Aliphatic C5-C6	ND - 0.03
Aliphatic >C6-C8	ND - 0.3
Aliphatic >C8-C10	ND - 3

Table 5.2: Summary of Soil Condition, Zone 4	
Determinand	**Concentration range following remediation (mg/kg)**
Aliphatic >C10-C12	ND - 4.2
Aliphatic >C12-C16	ND - 67
Aliphatic >C16-C21	ND - 310
Aliphatic >C21-C35	ND - 690
Total Aliphatics (C5-C35)	ND – 1,100
Aromatic C6-C7	ND
Aromatic >C7-C8	ND - 1
Aromatic >C8-C10	ND - 8
Aromatic >C10-C12	ND - 6.3
Aromatic >C12-C16	ND - 11
Aromatic >C16-C21	ND - 69
Aromatic >C21-C35	ND - 470
Total Aromatics (C5-C35)	ND - 570
Volatile Hydrocarbons (C5-C12)	ND - 22
Extractable Hydrocarbons (C12-C35)	ND - 1600
Total Hydrocarbons (C5-C35)	ND - 1600
MTBE	ND - ND
Benzene	ND - ND
Toluene	ND - 1
Ethylbenzene	ND – 0.36
m,p-Xylenes	ND - 4.4
o-Xylene	ND - 1.1
1,3,5-Trimethylbenzene	ND - 1.1
1,2,4-Trimethylbenzene	ND - 8.9
Napthalene	ND – 2.6
4-chloroaniline	ND
Isopropylbenzene	ND
n-Propylbenzene,	ND
4-Isopropyltoluene	ND

Table 5.2: Summary of Soil Condition, Zone 4	
Determinand	**Concentration range following remediation (mg/kg)**
Secbutylbenzene	ND
Napthalene	2.6
Acenaphthylene	ND
Acenaphthene	ND
Fluorene	ND
Phenanthrene	ND - 0.32
Anthracene	ND
Fluoranthene	ND - 1.5
Pyrene	ND - 2.1
Benz(a)anthracene	ND - 0.92
Chrysene	ND - 1.2
Benzo(b)fluoranthene	ND - 1.6
Benzo(k)fluoranthene	ND - 0.98
Benzo(a)pyrene	ND - 1.4
Dibenzo(a,h)anthracene	ND
Indeno(1,2,3-cd)pyrene	ND - 0.41
Benzo(g,h,i)perylene	ND - 0.38
ND – Below laboratory reporting limits	

Groundwater Analysis Results

Groundwater from BH15_01 was found to contain boron (0.04 mg/l), chromium (0.011 mg/l), nickel (0.007 mg/l), selenium (0.021 mg/l) and zinc (0.008 mg/l), with a pH of 6.7.

EPH (C10-C40) were detected in the groundwater sample at a concentration of 0.04 mg/l.

No PAHs, SVOCs or VOCs were detected in the groundwater from Zone 3.

ZONE 4 – SOLVENT STORAGE BULK TANKS

It should be noted that no remediation was undertaken in this area

Soil Analysis Results

Metals were detected in two soil samples recovered from Zone 14, 1.0 and 3.0m bgl in BH14_01. These metals included arsenic (maximum concentration of 43 mg/kg in both samples), barium (maximum concentration of 92 mg/kg at 3.0m bgl), beryllium (maximum concentration of 1.0 mg/kg at 3.0m bgl), boron (maximum concentration of 0.6 mg/kg at 1.0m bgl), cadmium (maximum concentration of 0.6 mg/kg at 1.0 m bgl), chromium (maximum concentration of 30 mg/kg at 3.0m bgl), copper (maximum concentration of 110 mg/kg at 1.0m bgl), lead (maximum concentration of 68 mg/kg at 3.0m bgl), mercury (maximum concentration of 1.0 mg/kg at 1.0m bgl), nickel (maximum concentration of 25 mg/kg at 3.0m bgl), vanadium (maximum concentration of 25 mg/kg in both samples) and zinc (maximum concentration of 190 mg/kg at 1.0m bgl).

BH14_01 contained sulphate concentrations of 440 mg/kg at 3.0m bgl. The pH of the soil in the Zone ranged between 5.8 (BH14_01 at 6.0m bgl) and 7.6 (WS14_01 at 0-0.2m bgl).

EPH (C10-C40) were detected in four soil samples and reached a maximum concentration of 150 mg/kg at 0-0.2m bgl in WS14_01.

The soil recovered from 1.0m bgl in BH14_01 was analysed for PAHs and was found to contain phenanthrene (0.2 mg/kg), fluoranthene (0.23 mg/kg) and pyrene (0.13 mg/kg).

The soil recovered from 3.0m bgl in BH14_01 was analysed for SVOCs and was found to contain naphthalene and 4-chloroaniline in concentrations of 4.3 mg/kg and 0.71 mg/kg, respectively. No VOCs were detected in the soil samples from the Zone.

Groundwater Analysis Results

A groundwater sample was collected from BH14_01 and found to contain boron (0.029 mg/l), chromium (0.006 mg/l), nickel (0.013 mg/l), selenium (0.038 mg/l) and zinc (0.007 mg/l). The pH was measured to be 6.6.

EPH (C10-C40) were detected in the groundwater sample at a concentration of 0.02 mg/l.

No PAHs, SVOCs or VOCs were detected in the groundwater from the Zone.

ZONE 5 – PALLET STORE AND DRUM COMPOUND

A strip around the perimeter of the drum storage compound was remediated to a depth of 0.8m.

The soil samples from BH16_01 were taken from a depth of 1.0m. The samples were tested for MTBE, Benzene, Toluene, Ethylbenzene, m,p-Xylenes, o-Xylene, 1,3,5-Trimethylbenzene and 1,2,4-Trimethylbenzene. With the exception of m,p-Xylenes (concentration of 0.05mg/kg) the remainder of the determinands were below the laboratory reporting limit (0.025mg/kg).

ZONE 6 – EFFLUENT BATCH TANKS

Soil Analysis Results

Approximately 1,569m^3 of soil was excavated and disposed off site at Hills Parkgate Farm landfill, Mopes Lane, Purton, Swindon, SN5 9HG. The results of the final validation analysis (103 samples in total) and the laboratory certificates are available on request. The final condition of the soils in the remediated area is summarised in Table 5.3:

Table 5.3: Summary of Soil Condition, ETP, Zone 6	
Determinand	**Concentration range following remediation (mg/kg)**
Total chromium	13 - 350
Hexavalent Chromium	ND (< MCERTS reporting limit of 5mg/kg)

It is noteworthy that any hexavalent chromium present within the samples was below the laboratory detection limit. The mean concentration of total chromium detected in the validation samples was 38.03mg/kg.

Groundwater Analysis Results

Hexavalent chromium was below laboratory reporting limits (<0.01mg/l) in all groundwater samples and total chromium was below laboratory reporting limits (<0.005mg/l) in the majority of groundwater samples. MW51 recorded a total chromium concentration of 0.008mg/l, MW48 a concentration of 0.007mg/l and BHD a concentration of 0.006mg/l.

Table 5.4: Summary of Groundwater Condition, ETP, Zone 6	
Determinand	**Concentration range following remediation (mg/kg)**
Total chromium	0.008
Hexavalent Chromium	ND (< MCERTS reporting limit of 0.01mg/l)

During April 2008 Alcoa undertook maintenance work on a gas main located adjacent to the Gors Fawr Brook. As part of the work, the culvert was exposed in two locations; approximately 50m north east of the ETP and approximately 80m north west of the ETP. In both locations the culvert was observed to comprise a concrete pipe approximately 1.2m in diameter, lying approximately 0.3m below ground level. A photograph of the exposed culvert is included in Annex F. Groundwater was not encountered in the excavations around the culvert. These observations suggest that groundwater within the alluvial deposits is not in direct hydraulic continuity with the Gors Fawr Brook.

ZONE 8 – COLD MILL ELECTRICAL TRANSFORMER COMPOUND

Hydrocarbon concentrations exceeded soil Baseline Data (7,713mg/kg) in the shallow limestone ballast in the north east corner of the Cold Mill Substation (a maximum EPH concentration of

12,000mg/kg was recorded). The contamination was associated with a localised transformer oil leak which occurred approximately 2 years ago.

Hydrocarbon concentrations in excess of Baseline Data were also detected in the shallow soils of an earth embankment which lies between the Cold Mill sub-station and the Cold Mill building (a maximum concentration of 53,000mg/kg was recorded). A localised area of hydrocarbon staining was noted on the bank and there was potential for the hydrocarbons to relate to contaminated water runoff from the hardstanding at the top of the bank (east end of the embankment) and from a localised drainage outlet at the west end of the embankment.

Localised transformer leak
Alcoa reported that approximately 20 litres of transformer oil was lost during a transformer leak during the Permitted period. The area impacted by the localised transformer leak was identified by Alcoa (covering an area of approximately 38m^2) and the contaminated ballast and sub-soil was excavated to approximately 0.15m bgl. Samples VS72, VS73 and VS74 were taken from the excavated area. Sample VS73 and VS74 were below Baseline Data. VS74 (16,000mg/kg) exceeded Baseline Data, therefore additional excavation and sampling (VS137) was undertaken, which reduced concentrations to below Baseline Data (VS137, 3,200mg/kg).

Western Embankment
Surface soils below the drainage outlet covering an area of approximately 1.3m^2 were excavated to a depth of approximately 0.25m bgl. VS160 was collected, which was below Baseline Data.

Eastern Embankment
The shallow soils were excavated from the embankment to a depth of approximately 0.25m bgl, over an area of approximately 47m^2. The embankment comprised Made Ground of red brown sandy silt with frequent fragments of shale. There were no visual or olfactory observations of hydrocarbon contamination within the soil matrix or on the surface of the embankment.

Six of the initial samples (VS40, VS41, VS68, VS69, VS70 and VS71) recorded hydrocarbon concentrations in excess of the Baseline Data, ranging between 7,800 to 30,000mg/kg. The lab indicated that the EPH descriptions did not provide a positive identification against the library of hydrocarbon compounds they hold. Furthermore, they report that there were no discernable olfactory observations of hydrocarbons within the samples and that the Gas Chromatogram trace did not show fuel style characteristics, but would suggest coal or tar like deposits. No tarry materials were visible in the soil and it was concluded that the elevated hydrocarbons related to the composition of the Made Ground rather than pollution from a permitted activity.

However, soils in areas where hydrocarbon concentrations remained in excess of the Baseline Data for the site were excavated and re-sampled. Final hydrocarbon concentrations across the surface of the eastern embankment range from 53mg/kg to 7,800mg/kg.

Additional Historical Contamination Identified
A low retaining wall approximately 0.6m in height runs along the base of the embankment. During the works it was noted that small volumes of water with an oily sheen was seeping from drainage holes at the base of the retaining wall, over a length of approximately 6m. The soils immediately behind the retaining wall were hand excavated in a trench 6m long and approximately 0.5m wide, to a depth of approximately 0.7m below the top of the retaining wall.

Ground conditions comprised red silty sandy Made Ground with frequent shale fragments (as on the surface of the embankment) to approximately 0.5m below the level of the embankment, underlain by clay. The clay was stained black with a hydrocarbon odour and perched water collecting in the base of the trench was noted to have a sheen. Samples of the soil at the base of the trench were collected (VS34 and VS35, VS96 and VS97) and hydrocarbon concentrations in these samples ranged from 3,600mg/kg to 65,000mg/kg. The hydrocarbons were characterised by the laboratory as 'three overlapping humps of unresolved complex material eluting from C11 to beyond C40, overlain by several peaks unidentifiable by this analysis'.

During the permitted period, hydrocarbons have not been used in this area of the site and no spillages have occurred in the vicinity of the embankment. The presence of this contamination at depth behind the retaining wall is considered to relate to historical activities rather than Permitted activities.

In total approximately 3m^3 of soils was excavated from Zone 8, and was disposed off site at Hills Parkgate Farm landfill, Mopes Lane, Purton, Swindon, SN5 9HG.

The results of the validation analysis are presented in Annex C and the analytical certificates are available on request. The condition of the soils at Permit Surrender in Zone 8 are summarised in the table below:

Table 5.5: Summary of Soil Condition at Permit Surrender , Zone 8

Determinand	Concentration range following remediation (mg/kg)
Localised transformer leak	
EPH C10-40	47 – 3,200
Eastern Embankment (surface soils)	
EPH C10-40	18 – 7,800
Eastern Embankment, behind retaining wall	
EPH C10-40	3,600 – 65,000
Western Embankment	
EPH C10-40	7,200

It should be noted that there remains an amount of EPH contamination in the area of the cold mill electrical transformer compound, which should be taken into account at the time of permit surrender.

Annex D: Data Assessment

Annex D1: Potentially Polluting Substances

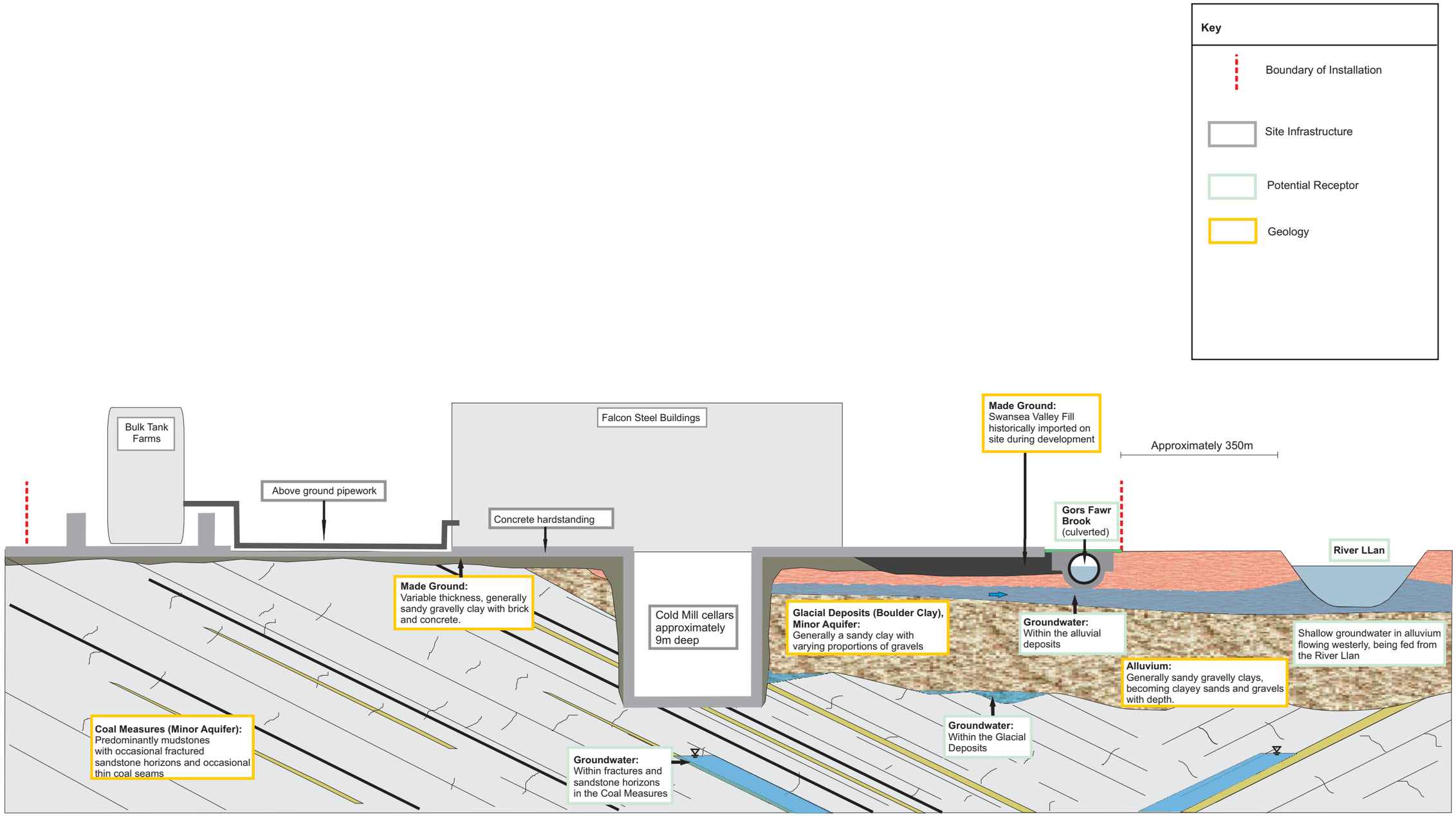
D1: Potentially Polluting Substances

Material	Constituent	Quantity per annum	Fate
Pre treated Hot dipped Galvanised Steel Coils	0.35mm x 1105 mm 0.5mm x 1220/1250mm 0.65 x 1220/1250mm	72,000 tonnes	100% product to client
Water	Water 100%	~1000 (tonnes)	100% drag-out and discharged to sewer
Ridolene 287Y	Potassium Hydroxide 5 -25% Xylene Sulfonate – Na 5-10% Tetrapotassium (1-hydroxyethaylidene) bisphosphonate (1-5%)	18 tonnes (s.g. 1.38 kg/litre	80% dragout in rinsewater to sewer. 20% onto product
Coiltech ZR 360	Chromium Trioxide >= 3-<5% vol Dichromium Tris(chromate) 1-10% vol	10 tonnes	(100% to product)
PVC Coating materials	Antimony Trioxide 1-5% Butyl Acetate <1% Petroleum Distillates 1-5% Ethylbenzene <1% Triphenyl Phosphite <1% Xylene <1%	156,000 (litres)	100% of solid content goes to product. 100% of VOC content goes to thermal oxidiser (where 95-99% is destroyed in thermal oxidiser, and 1-5% fugitive emissions to atmosphere)
PVC (plastisol) Primer	4-Hydroxy-4-Methylpentan-2-One 30-60% 1-Methoxyl-2-Propanol 2-Methoxy-1-Methylethyl Acetate <1% Strontium Chromate 1-5% Butanol-Norm 1-5% Solvent Naptha (Petroleum), Light Arom; Low boiling point 1-5% Cyclohexanone 1-5% Methyl methacrylate 1,2,4 trimethylbenzene 1-5% Epoxy Resin	153,000 (litres)	100% of solid content goes to product. 100% of VOC content goes to thermal oxidiser (where 95-99% is destroyed in thermal oxidiser, and 1-5% fugitive emissions to atmosphere)
Backing coat	1,2,4 trimethylbenzene 1-5% 2-Butoxyethanol 1-5% 2-Butoethyl Acetate ,<1% 2-Methoxy-1-Methylethyl Acetate <1% 4-Hydroxy-4-Methylpentan-2-One <1% Butyl Acetate – norm <1% Ethandiol <1% Ethylbenzene <1% Formaldehyde <1% Iso-Butanol 1-5% Melemine RPW Formaldehyde Methylated 1-5% Mesitylene <1% Napthalene <1% N-Methyl-2-Pyrrolidone <1% Propan-1-ol <1% Propan-2-ol <1% Solvent Naptha 100 1-5% Solvent Naptha 5-10% Solvent Naptha (Petroleum), Heavy Arom; Kerosene-Unspec 1-5% Strontium Chromate 1-5% Xylene 1-5%	176,000 (litres)	100% of solid content goes to product. 100% of VOC content goes to thermal oxidiser (where 95-99% is destroyed in thermal oxidiser, and 1-5% fugitive emissions to atmosphere)
Primers	1,2,4 trimethylbenzene 5-10% 2-Butoxyethanol <1% 2-Methoxy-1-Methylethyl Acetate 5-10% Butanol-Norm 1-5%	135,000 (litres)	100% of solid content goes to product. 100% of VOC content goes to thermal oxidiser (where 95-99% is destroyed in

Material	Constituent	Quantity per annum	Fate
	Epoxy Resin 1-5%		thermal oxidiser, and 1-5% fugitive emissions to atmosphere)
	Formaldehyde <1%		
	Light Aromatic Petroleum Naptha 5-10%		
	Melemine RPW Formaldehyde Methylated 5-10%		
	Mesitylene 1-5%		
	Solvent Naptha (Petroleum), Heavy Arom; Kerosene-Unspec 1-5%		
	Solvent Naptha (Petroleum), Light Arom; Low boiling point 1-5%		
	Strontium Chromate 5-10%		
Polyester Coating materials	2-Butoxyethanol 1-5%	94,000 (litres)	100% of solid content goes to product. 100% of VOC content goes to thermal oxidiser (where 95-99% is destroyed in thermal oxidiser, and 1-5% fugitive emissions to atmosphere)
	Solvent Naptha (Petroleum), Heavy Arom; Kerosene-Unspec 5-10%		
	Solvent Naptha 100 5-10%		
	2-(2-Butoxyethoxy)Ethanol 1-5%		
	Hexamethoxymethyl Melamine 1-5%		
Methyl Ethyl Ketone (MEK)	2-Butanone 99-100%	10,000 (litres)	100% to thermal oxidiser (where 95-99% is destroyed in thermal oxidiser, and 1-5% fugitive emissions to atmosphere)

Annex D2: Assessment of Land Pollution Potential

Annex E: Conceptual Site Model



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Title **Figure E1**

Conceptual Site Model

Client	**Falcon Steel Ltd**		
Scale	**NTS**	Date	**May 2008**
Project No	**64-C13317**	Drawn by	**MR**